United States Court of Appeals

for the Second Circuit

JOINT APPENDIX

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P/S

76-4044

United States Court of Appeals
FOR THE SECOND CIRCUIT

No. 76-4044

BOC INTERNATIONAL LIMITED, f/k/a The British Oxygen Company Limited, BOC FINANCIAL CORPORATION, BOC HOLDINGS, LIMITED, and BRITISH OXYGEN INVESTMENTS, LIMITED,

Petitioners,

—against—

FEDERAL TRADE COMMISSION,

Respondent.

No. 76-4045

AIRCO, INC.,

Petitioner,

—against—

FEDERAL TRADE COMMISSION,

Respondent.

ON PETITIONS FOR REVIEW OF AN ORDER
OF THE FEDERAL TRADE COMMISSION

JOINT APPENDIX, VOLUME 9
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EXHIBITS

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FILED
JUN 25 1976
DANIEL FUSARO, CLERK
SECOND CIRCUIT

PAGINATION AS IN ORIGINAL COPY

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BOC RX 200	Document consulted by Dr. Hedley-Whyte during direct examination	A5218
BOC RX 206	June 1, 1970 Report on visit to Carpenter Technology by Perham and Muller	A5219
BOC RX 208	U.S. Dept. of Commerce, *U.S. Industrial Outlook*, 1974	A5222
BOC RX 222	Sept. 29, 1972, R. C. Hesketh-Jones, Consultation BOC-Overseas Companies	A5224
BOC RX 223	July 21, 1972, R. C. Hesketh-Jones, Overseas Company Boards	A5227

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BOC RX 228	Program for the American Society of Anesthesiologists Annual Meeting, Oct.7-11, 1973	A5231
BOC RX 234	May 19, 1970 Letter from D. R. Harris to J. A. Perham	A5249
BOC RX 243	Percent Return on Total Invested Capital	A5250
BOC RX 244	Percent Return on Stockholders' Equity	A5251
BOC RX 246	Graphs of gas volume, quantity and unit price	A5252
BOC RX 260	Perry paper on oxygen and nitrogen (not in evidence)	A5265
BOC RX 261	American Iron & Steel Institute 1973 Report (not in evidence)	A5271

Exhibit Offered by Respondent Airco, Inc.

RAX 7	Airco Annual Report for 1973	A5274

Volume 10—In Camera Filings*

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* The Table of Contents for Volume 10 appears only in that volume.

A4790

CX-243

Mr L. E. Smith

L. E. S.

3 June, 1970
JM /MFJ

PJG/JA

PRIVATE AND CONFIDENTIAL

P. J. Grant Esq.,
Lazard Brothers & Co. Limited,
[illegible] Broad Street,
[illegible].2

Dear Peter,

BURDETT OLSEN:

Thank you for your letter of 2 June.

I do not think that our interest in Burdett is sufficient to warrant your taking any further action.

It may be that if there comes a major bust up we could be interested, and I am sure you will keep Kuhn Loeb alerted to such a possibility. But, in the meantime, I do not think it would be profitable for either of us to spend much time on this forlorn operation.

Yours sincerely,

(J. M. Williams)

BEST COPY AVAILABLE

A4791

23 September 1970

CX-244-A

LES telephoned JAP. He had contacted Peter Reed (solicitor to Harris Calorific), who has close contacts with the bankers who now effectively own Burdett. Peter Reed has let it be known that, in the event of a piecemeal sale of Burdett assets, there is a party who might be interested in buying the Niagara Falls plant.

JAP is satisfied that this move is sufficient to safeguard our interests for the time being.

A 4792

September 8, 197[illegible]

President, Canox
Mr. J. A. Perham

Burdett Oxygen Company of Cleveland, Inc.

Group Managing Director, BOC
Mr. L. E. Smith

Dear Leslie:

I received a telephone call from Mr. Ed Biskis, Director Chemical Diversification, of Northern Natural Gas Company in Omaha, Nebraska. You will recall that Dore Greenfield and I visited him during our market study in the USA late in January. Biskis was then aware that we were looking for business opportunity in the States.

He asked me if I was fully aware of the Burdett Oxygen Company of Cleveland, Inc. problem. He says the creditors are now essentially in control. Mickey Loveman virtually has no say and the business is being supervised by a consortium of four American banks headed by Union Commerce of Cleveland. A Mr. Joe Roberts, Vice Chairman of Union Commerce is the head man of the consortium. Incidentally, he was formerly Finance Vice President of Air Products and is therefore conversant with our industry.

Biskis said that our Canadian competitor, L'Air Liquide, through American Cryogenics, appears to be vitally interested. He said that essentially the equity of the Loveman family in Burdett has been washed out and that the plants at Joliet (Chicago) and Niagara Falls (New York) are probably to be sold and heavily discounted. For example, the Joliet plant cost $6.8-million. While it is producing gaseous oxygen to this state, the 200 tpd liquefier has not operated satisfactorily, and an investment of over a million dollars for argon production is not working at all. This plant could probably be bought by someone for $4-million.

Biskis said that removing the supply contracts leaves merchant sales of about $12,000,000 a year and this business will be picked up by someone for less than $4,000,000. He believes that Burdett will have to be sold in the next three to six months' time.

I give you this news for information only as it is obviously most unlikely that BOC would be interested. If I hear anything further I will let you know.

Sincerely,

Dec - Le Gouk A4793
re Linde-Union

CX-245

October 9, 1970

Mr. S. Michael Loveman
President
Burdett Oxygen Company
3300 Lakeside Avenue
Cleveland, Ohio 44114

Dear Mickey:

Some two years ago I had a most enjoyable day with you at your office. You may remember I asked if Burdett ever wished to sell any assets that CANOX (BOC) could possibly be interested.

As you would expect, there are rumours that L'Air Liquide (American Cryogenics) would like to buy your company. The latest is that Unibraze Corp. have the same idea. You told me at the CGA meeting at Seaview last June you were negotiating to dispose of your Joliette plant.

None of these ideas are of real interest to CANOX, but if you should ever decide to dispose of your Niagara Falls plant we could be interested. As you no doubt know, CANOX does not have a tonnage source of oxygen and nitrogen. Your Niagara Falls plant could be an answer for our long term future.

Please keep CANOX in mind if your thinking ever develops in this direction.

Sorry I have to miss the IOMA meeting, but our Airco Canada acquisition is sure keeping me busy. Hope you enjoy the sun and surf, not to mention golf.

Sincerely,

JAP/P

J. A. Perham
President

Notes on Meeting at Hammersmith House - 3 October 1969

CX-246

A 4794

Mr P Laister
Mr R C Hesketh-Jones
Mr N F J Reckitt
Mr D W E Stafferton
Mr K D Moore
Mr H S Rich
Dr G Winfield
Mr T van Tijn
Mr A L Cornford
Mr M J Lamb
Mr J A Perham
Dr A Muller

Mr Laister outlined recent decisions on practical aspects of search for opportunity in North America.

1 First priority will be given to an industrial gases study which is now set in hand for urgent completion by Planning Secretariat with Mr J A Perham. All other investigations to be suspended meanwhile and US firms already contacted to be advised on appropriate terms under guidance from Mr Perham.

2 Selection of next area for study would follow when work on 1 complete. UK Divisions should make their case to Mr Laister if they wished one or more of their own business cases to feature high on priority list. Possible that medical or metals might feature next.

3 Nothing in the above is intended to diminish or delay UK Divisions' efforts to promote exports of their products to North America, but no long term agency or similar arrangements should be entered into which might conflict with future developments without prior reference to CE Overseas.

4 When in doubt on possible consequences of any proposed trading activity or future developments, eg licensing in and out, advice should be sought from CE Overseas before commitment.

5 Requests for assistance by Mr Perham/Dr Muller in obtaining market research information should be discussed with Overseas Division before writing to North America to ensure correct priority and adequacy of brief.

Circulation : Those present
Chief Executives

RCHJ/AC
11 November 1969

A 4795

(19)

CX-247

June 16, 1969

Mr. Kevin J. Bradley
Senior Vice President
Dean Witter & Co. Incorporated
14 Wall Street
New York, N.Y. 10005

Dear Kevin:

I should have written to you and Dick de La Chapelle before this to thank you for the reception and the excellent lunch you gave Bob Stevens and me on May 27th. I delayed until I had received some extra copies of the British Oxygen Annual Report for 1968. Enclosed are the ten copies you requested and also three copies of a list of CGA members.

During lunch I remember a brief mention of the Sargent Welch Scientific Co. Inc. There were rumours of a Board Room row and that they might spin-off their Vacuum Products Division. If it comes to your ears that there is any possibility of this would you please remember our interest. I seem to recall that you or someone at the lunch knew of this situation. About eight months ago they hired a Mr. J. Robert Krebs to manage this Division and I believe the situation is now changed.

Finally, if you should learn the terms under which L' Air Liquide acquired American Cryogenics from Standard Oil of New Jersey it may be helpful to us.

Sincerely,

JAP/P

J. A. Perham
President

cc: Richard de La Chapelle
R. W. Stevens

A 4796

CX-248-A

Still Hollow Road-RD 2
Lebanon, New Jersey 08833 USA

October 21, 1969

Mr. J. Allan Perham
Canadian Oxygen, Ltd.
355 Horner Avenue
Toronto 14, Ontario

Dear Allan:

At the time of our telephone conversation I indicated I would list the various assignments that I received from members of the B.O.C. staff during my recent trip to London. These are as follows:

1. Acquisition/Joint Venture Area
(Key BOC contacts --J. A. Pernam/c. Hesketh-Jones)

OK (a) Terminate all active propositions, except those relating to the industrial gas business.

Later (b) Assist in the analysis and evaluation of opportunities for BOC in the industrial gas area.

2. Technology (Key BOC contacts - J.M. Williams/J. D.Gardner)

John Gardner provide all point - for technical restons

(a) Investigate new low temperature refrigeration concepts: Gardner FOA - energy separation; Malaker Stirling cycle engine

(b) Investigate ion implanatation techniques and equipment Smith/ Williams

(c) Monitor use of oxygen and ozone in waste treatment Gardner

(d) Monitor U.S. superconductivity developments Gardner/Goodman

(e) Investigate new methods of welding and joining - Requested by Rickett

3. Commercial Activity (Key BOC contact - C.E. of appropriate division)

(a) Locate a manufacturer interested in producing Root's type vacuum and positive pressure blowers under agreement with Edwards (W. Smith)

(b) Locate outlets for the sale of industrial gas equipment in the U.S. (N. Rickett) Possibly UNIBRAZE (Jerry Robinson)

...

A 4797

CX-248-B

Mr. J. Allan Perham
Canadian Oxygen, Ltd.

October 21, 1969
page 2

4. Miscellaneous

(a) Obtain information on Air Products "Apache" gas (H. Rich)

(b) Interpret U.S. gases statistics for Central Planning (H. Rich)

(c) Obtain U.S. Department of Commerce reports for Central Planning (H. Rich)
Subscription about $28/ per year.

My understanding of priority basically comes from you. During our brief meeting in London, you indicated that the program to analyze the U.S. industrial gas situation was to receive first priority. I think we should discuss this in some detail when we meet in New York.

With best regards,

Sincerely,

Albert Muller

AM-es

American Sterilizer ~~Surgical Supply~~
Not currently interested in Joint venture
Interested in
A. Outlet for sterilizers in U.K
B. Distributor for Boyle in U.S.A.

CX-249

A 4798

BURDETT OXYGEN CO.
6300 LAKESIDE AVENUE
CLEVELAND, OHIO 44114

S. MICHAEL LOVEMAN
PRESIDENT AND CHIEF EXECUTIVE OFFICER

TELEPHONE 606-2400
AREA CODE 216

13 October 1970

Mr. J. A. Perham
President
Canadian Oxygen Limited
355 Horner Avenue
Toronto 14, Ontario, Canada

Dear Allan:

Many thanks for your letter of last week and the comments contained therein.

As you have indicated, I have also heard the same rumors that have reached your ears - that L'Air Liquide (American Cryogenics) is interested in buying our Company. I don't blame them. We feel it's an excellent company. In addition to the rumor associated with that company, you might add yourself and AGA to this most prominent list. It does, however, come as a complete surprise that Unibraze is interested in acquiring our operation, as this company is the furthest from my mind with whom we would even entertain talking merger.

I believe these rumors to be interesting to hear, and if you have anything further on same, please advise.

We are not at this time contemplating the sale of our Niagara Falls Plant which does not mean that it would not be a possibility in the future. Perhaps at an appropriate time this might be worthy of discussion but timing is not proper right now.

Warmest personal regards.

Sincerely,

Mickey

SML:dh

S. Michael Loveman

A 4799

EX-250-A

JAW discuss folder

BURDETT OXYGEN CO., NORRISTOWN, PA

C.D.L. PERKINS, EXECUTIVE VICE-PRESIDENT
11 August, 1971

Mr Perkins introduced himself via ICI and Chesterfield Tube.

The name of Burdett Oxygen Company is entirely confusing as there is no corporate relationship with the Micky Loveman Burdett Oxygen Company. It appears that, while there was a family connection many years ago, there is none now, and Perkins' Burdett Oxygen is distinguished by being smaller; by being profitable and, according to him, straightforward.

Perkins himself was until nine years ago a salesman for Air Reduction and landed up being the Vice-President Marketing for AIG in Pittsburgh. He then went on to his present job heading "a group of companies" which are clearly connected by personal links and ownership links rather than by corporate links.

Total sales are alleged to be of the order of $10 million per annum, of which $3 million is in the field of Welders Engineering Research Company, which is in effect a co-operative buying group for welding distributors.

Of the remaining $7 million turnover, probably $5 million or more is in industrial gas products; the remainder being in gear, the principal lines which they sell being Victor and Lincoln.

Perkins' objective in coming to talk to us was to interest us in buying into this group of companies, thus releasing capital for himself, Perkins; although he wants to go on running the business and has ambitions to make it grow such that it can take over Big Three as and when Harry Smith, seen as a solo operator, has to retire from the scene.

He claims that all the US companies, except American Cryogenics, NCG, Big Three, Liquid Carbonic and the other Burdett Oxygen would be barred by the Justice Department from buying him.

He regards the other Burdett Oxygen as a complete joke, being run as a family plaything with a great deal of under-the-table operations, and having no management that he would respect, let alone any money or credit to buy him.

He is only slightly less rude about the management of NCG and Liquid Carbonic, although he did not propose that they had anything underhand.

He would not wish to sell himself to Big Three because of the likely static between himself, Perkins, and Harry Smith; anyway, he regards the operation as in parts vulnerable and overpriced in the stock market. At the same time, he evidently has a distaste, not so much for Pierre Salbaing himself, but for the management of the American Cryogenics business in the USA.

He evidently believed that BOC at some time must go into the States, although he was considerably ignorant about Allan Perham and CANOX. His reaction to the view we had developed in the course of our investigation into the gas business in USA at the beginning of 1970 was that those conditions applied in the north and mid-west, but did not apply in the south, where there were a number of local companies who made considerable profits and whose markets were expanding, and yet again had been left alone by the majors.

He had contracted to supply nitrogen to the ICI plant at Hopewell by being on the scene beforehand. The plant there had been badly bought and was now operating sensibly, though after considerable running in costs and troubles. Bought from Process Control.

The important sales areas for the businesses are said to be in Philadelphia and Virginia, as well as Syracuse in New York State.

Cx-250-C

He believes that there are many opportunities in new processes and has been to see the pulp bleaching operation in Sweden. He claims to have been asked to build a plant for a similar pulp operation (Chesapeake ?) and not to have money.

Some people have considered buying him, but in the last three/five years he claims nothing has got to a very serious state. One difficulty is that he makes rather a lot of money and requires his interest to be covered in some fashion.

The founding family extracts $100,000 a year from the system by some devious means, but this is said to be the only non-straightforward part of the accounting for the group.

If we should wish to take the matter forward, the appropriate thing would be to have two people go over to Philadelphia and he would undertake to open the books and the operations fairly fully.

Either he thought that we would be particularly stimulated by the idea, or he has some genuine wish to attack AP. He claims he knows their weaknesses and thinks that Leonard Poole has had it his way too long and it would be a good thing to upset their equanimity.

All this talk came packaged together with a plea that we should join the Independent Oxygen Manufacturers' Association and their annual get-togethers - at which he has met Ronnie Hardwick.

He rates IOMA many leagues ahead of CGA, which is "a commercial operation having the suppliers present also, who buy drinks for the pure gas operators and thereby cloud the issue. IOMA only has the top people in the gas business and is to that extent pure and unsullied."

An engaging character and at this very brief glance more probably honest than dishonest.

JMW/11 August, 1971

Mr L. E. Smith
Mr P. Laister
Mr R.C. Hesketh-Jones
Mr D.W.N. Pitts
Mr H.S. Rich

A 4802

CX-251

26 August 1971

D.W.N. Pitts, CMH

DWNP/TF

Mr J.N. Williams

Jane
Open file for me.
B/F 1st Sept

Copy to: Mr I. Temple-Roberts

BURDETT OXYGEN CO, NORRISTOWN, PA

1 We spoke on this and I would very much like Ian Temple-Roberts to go out and see Mr Perkins with the purpose of forming a view on the potential attraction of Burdett as an investment. Ian would be free to travel any time after Monday, 13 September.

2 If you are happy with these arrangements can I suggest that the next step might be for RCHJ to have a word with Allan Perham.

3 As I see it, the exercise on Burdett would need to be carried out by IMR in close concert with Allan Perham who he already knows, having met him on his previous trip to the same area last year.

Original signed by
D. W. N. Pitts

A 4803

cc: Mr D.W.N. Pitts, GWH

CX257

Mr C.D.L. Perkins,
Burdett Oxygen Company,
1, Schuylkill Avenue,
Norristown,
Penna. 19404. U.S.A.

18 October 1971

(Dear Chill)

Since my return in a 6 hour fog delay at Heathrow, I have been in Denmark for a few days and back here since Tuesday. We have, however, started to work through the very helpful amount of information you provided. We shall give it our best attention, both here and at Hammersmith.

The significance of the Marox investment and its operational success becomes very clear. Slight, but probably reliable, extra information on other plant constructed by the same people confirms you have a job on your hands. We should be interested to hear how the next test goes (in November?).

In addition to Marox and the financial state of the Burdett companies, serious thought will need to be given to the long term position which it may be possible to reach by following the route you have proposed. The advantages and disadvantages of the industrial gas business in the States are reasonably well known to us, but the ultimate size and vulnerability of what we may "accumulate" will need to be well assessed before we commit ourselves to "speculate".

I am having prints made of the photographs I took and will send you a copy of each. If you would like more, please let me know. Would you please ask Dean Guy if he would kindly let me know the details on the "BOC clock" on his office shelf; I have accidentally destroyed the note I took; I will then find out more about the man (? Mr Jackson, Manchester, 1929).

We shall write again soon. Meanwhile, my thanks again for your hospitality and help. I thoroughly enjoyed meeting you and your managers, and much appreciated the time they gave me. Please give my kind regards also to your wife and to Mr McCormick.

Sincerely,

Original signed by
I. TEMPLE ROBERTS

I. Temple Roberts.

ITR/jcl

A 4804

CA-258

Mr C.D.L. Perkins,
Burdett Oxygen Company,
1, Schuylkill Avenue,
Norristown,
Penna. 19404. U.S.A.

PERSONAL AND CONFIDENTIAL.

16 November 1971

It has taken some time and real consideration (and I have been in Europe again) to come to a reasonable decision on your suggestions. It is that we should continue to review with you the opportunity offered as long as you would wish but that, at this time, we should not try to commit ourselves to the sequence of investments we discussed.

There are two main reasons for this decision, which I trust you will understand. The first has to do with that longer term position in the U.S.A. which would face us in, say, five years after a successful pursuit of the lines proposed. We have no wish to be minor and vulnerable participants in a market and we do not see with sufficient certainty what strengths we would possess either in marketing or money terms. The second is the need in the immediate future to concentrate our focus on the new European opportunities which are already demanding much management time.

We are aware of the sort of profits which can be made in the U.S. market and are keenly interested to improve this awareness. This would help clear the longer view.

Your offer to come over to bring more details about Burdett Oxygen is appreciated, but we believe brings us too soon to details which could not be resolved without agreement on the longer view.

We should be glad to know how you see the situation in the light of our decision. I believe that we should seek some way to help both our interests.

Again, please accept our thanks for the frank way in which you have presented your views. I shall look forward to hearing from you and, I trust, to continuing a useful dialogue.

My best wishes to all your people and sincere regards to KP and yourself.

I. Temple Roberts.

P.S. I hope you received my earlier letter and the photographs.

A 4805

CX-28

BOC

date 9 January 1973

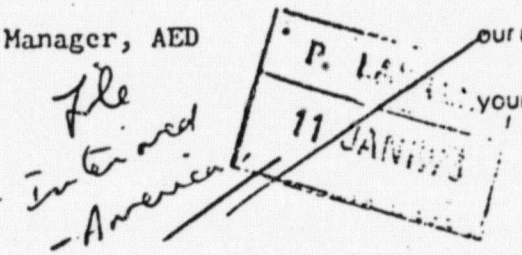
from Divisional Planning Manager, AED

our ref JNH/JRB

to Mr A I Ray

your ref

cc Mr R Hopton
Mr R J Williams



Chemetron/Forreger

The possibility that Anti-Trust difficulties will be encountered if BOC successfully acquire both Chemetron and Forreger cannot be discounted.

The US market in lung function equipment was around $66m (1971). If medical gases are included this could be up to $100 ± 20m by now. Leading companies have the following sales -

Ohio	$38m	medical equipment and gas
Forreger (estimate)	$ 7m	medical equipment
Chemetron (estimate)	$18m	medical gas and equipment.

Thus, by having Forreger and Chemetron together with F.S. Inc. we might have 20 to 25% of the market. This would probably be reviewed by the US Government.

Obviously we must be aware of these possible difficulties, but in the meantime we should press on with negotiations to acquire both companies (assuming both are for sale).

James N Hiddleston

A 4806

CX-289

(7)

October 17 1973

Mr. S. M. Loveman
Burdett Oxygen Company
3300 Lakeside Avenue
Cleveland, Ohio
44114

Dear Mickey:

Many thanks for your kind hospitality last Monday.* I feel that my visit with you was well worthwhile, and I gained a good insight into your operation.

*OCT 15/73

As promised, I enclose copies of our appraisal forms. Number 1 should be handed to the individual to be appraised at least a week or 10 days before the actual appraisal. Number 2 should be filled out by the appraiser prior to the meeting and "Staff Appraisal Form 1" should be filled in at the time of discussion and agreed by both parties except for the last page. We have found these forms to be very helpful to both the manager and the managed.

Hope they will be helpful to you. Best regards.

Sincerely

A.R. Tow
President

ARD/G
encl.

A4807

CX-292-A

BOC

1975

A4808

CX-292-B

BEST COPY AVAILABLE

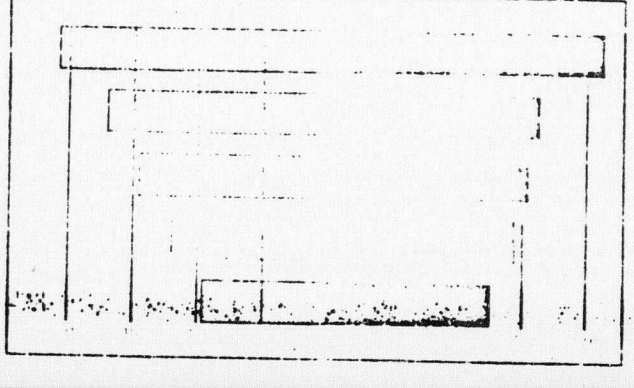
Group results at a glance 1972/3

CX-292-C

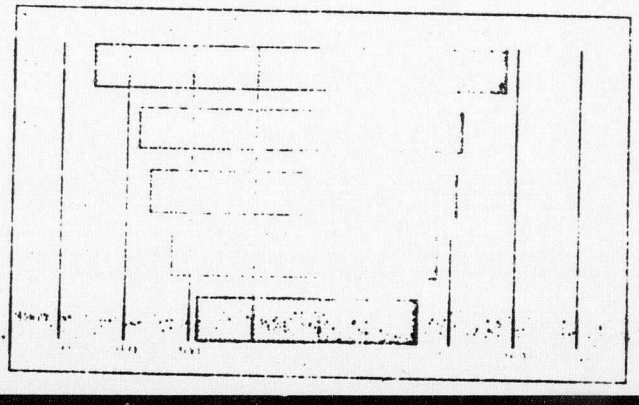
A 4809

	1973	1972
Sales	£319 122 991	£252 588 814
Group trading profit		
UK and Europe	20 943 302	17 476 372
Overseas	21 325 611	16 054 178
	£42 268 913	£33 530 550
Disposable profit		
Dividends:	(under imputation tax system) 4 581 461	(under former tax system) 6 226 614
Retained profit	7 880 289	4 920 434
	£12 461 750	£11 147 048
Average capital employed	£267 953 537	£223 487 033
Return on capital	14.5%	13.5%
Earnings per 25p share	5.55p	5.00p
Ordinary dividend per 25p share:		
	(under imputation tax system) 2.205p	(under former tax system) 3.[illegible]
	equivalent to 3.15p	

Group profit (before tax, interest, development and research)



Group sales



Summary of Chairman's Statement

A4810

Difficult to anticipate 1974 trading pattern owing to uncertainties at year's end. UK sales and earnings will probably fall, but not substantially unless recession is severe and prolonged. Over 40% UK business is in gases where tonnage contracts and cylinder rentals provide some protection against difficult times. Substantial part of remainder is exports which we hope to increase or at least maintain.

Shortfall in UK earnings should largely be made up abroad.

There may be pressures on cash flow. Lines of action being examined to take account of cost of existing plans and of our stake in Airco and its future development.

Airco, USA: one of three major American gas companies. Acquisition of over one third of Airco's common stock was result of determination to grasp unique opportunity to pursue long term objectives despite difficulties at home.

Industrial gases not exportable; Group's future lies in expanding international operations, especially in 'core' business (gas and equipment). Establishment of production units overseas whenever profitable opportunities occur, earns good marginal returns on technological and managerial skills and attaches us to national growth rates usually exceeding that of UK.

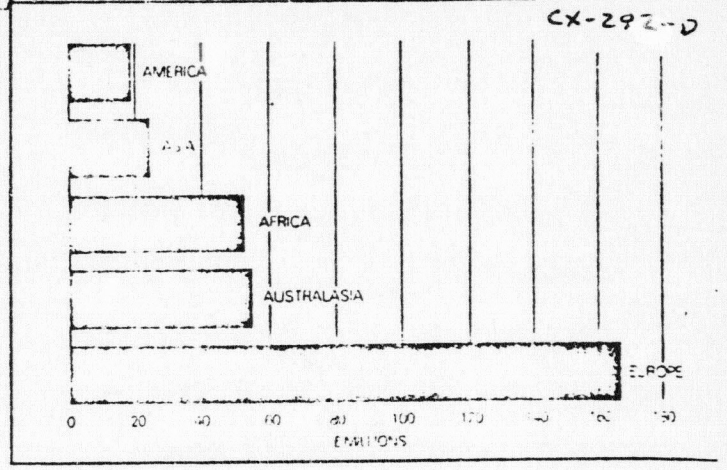
World gas markets are dominated by large international companies; BOC well placed to strengthen and defend itself.

Risks involved in our policy of increased international operation are minimised by long experience, through which we have evolved a code of behaviour based on respect for national pride, law and purpose of the countries in which we operate.

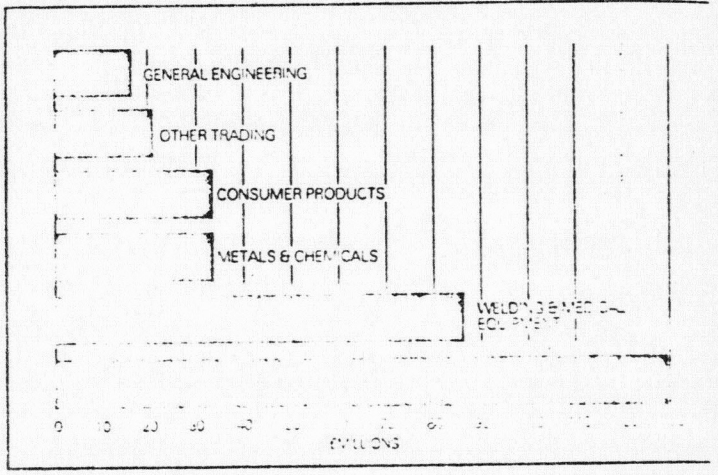
'I cannot believe that the "no growth" concept now being aired in the UK will appeal to that larger part of the world which still goes without an adequate supply of the necessities of life. To most countries the need for increased wealth is obvious and immediate. It is a need to which BOC is ready, and able to make a valuable contribution'.

Destination of group sales by continent 1972-73

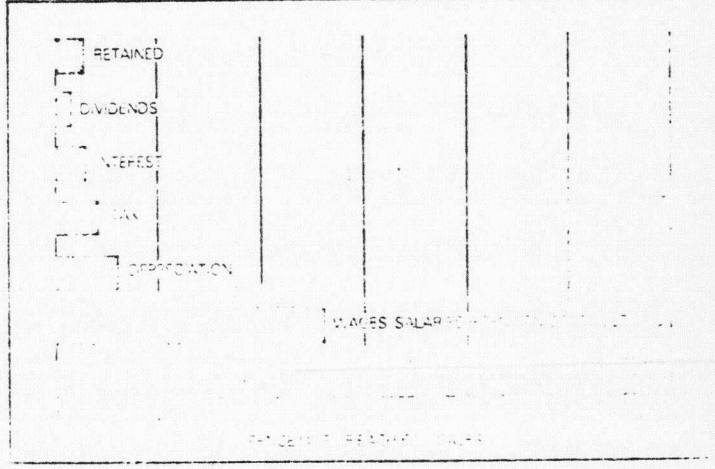
CX-292-D



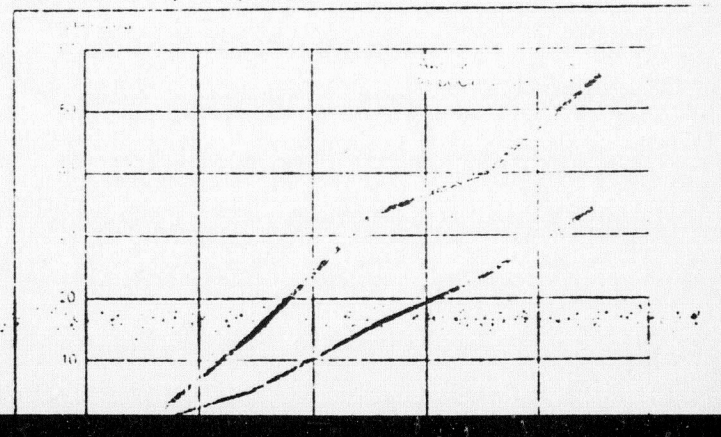
Analysis of group sales by product groups 1972-73



How we spent the money in 1972-73



Increase in pay and prices



Directors' Report and Accounts

CX-292

A 4811

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A 4812

The British Oxygen Company Limited

CX-292-F

Board of Directors

Chairman	L E Smith
Vice Chairman	Sir Geoffrey Eley CBE
	Sir John Cowley GC KBE CB
	Lord Elworthy GCB CBE DSO MVO DFC AFC
	I J Fraser CBE MC
	Sir Owen Wansbrough-Jones KBE CB
Managing Directors	R C Hesketh-Jones
	P Laister
	J M Williams

Management

Trading Divisions		
Advanced Engineering	Chief Executive	A I A Ray
Chemicals	Chief Executive	D R Scarffe
Consumer Products	Chief Executive	W Abel Smith
Gases	Chief Executive	D W N Pitts
Metals	Chief Executive	G Winfield
Welding Products	Chief Executive	D Melvin
Other Trading Units		
BOC Transhield Ltd	Managing Director	R W Broome
Cryoplants Ltd	Managing Director	K Parfitt
Central Services		
	Head of Central Services	B W Mills
Group Headquarters		
	Director of Group Strategy	P G Bosonnet
	Chief Adviser, Finance	to be appointed
	Chief Adviser, Human Resources	J J Lynch
	Chief Adviser, Planning	B W D Reed
	Chief Adviser, Public Affairs and Communications	A Eden-Green
	International Welding Co-ordinator	N F J Reckitt
	Company Secretary	C A B Leslie

Auditors

Coopers & Lybrand

Notice of meeting

A 4813

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Notice is hereby given that the eighty-eighth Annual General Meeting of The British Oxygen Company Limited will be held at the Confederation of British Industry, Council Chamber, 21 Tothill Street, London SW1, on Thursday 21st March 1974 at 11.30 am.

1

To receive and consider the statement of accounts and the reports of the Directors and Auditors thereon and to declare a dividend.

2

To elect Directors.

3

To authorise the Directors to fix the remuneration of the Auditors.

4

To transact any other business that may be transacted at an Annual General Meeting.

By order of the Board

C A B Leslie

Secretary

Notes

1 Only holders of Ordinary shares are entitled to attend or be represented at the meeting. A member entitled to attend and vote may appoint one or more proxies to attend and vote instead of him. A proxy need not be a member.

2 No Director has a service contract which does not expire, or which is not determinable by the Company without payment of compensation, within one year.

3 Warrants will be posted on 28th March if the proposed dividend is approved.

Registered Office

Hammersmith House London W6

25th February 1974

A Proxy Card is enclosed for holders of Ordinary shares

Chairman's Statement

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The results for the year ended 30th September 1973 are reviewed in the Report of the Directors. Since the close of the year uncertainties of many kinds have crowded in upon us, as witnessed by the collapse of the Stock Market in November and December. The assumptions on which we had based our UK forward budgets are no longer valid and, as yet, we have no means of forecasting with any certainty the trading pattern for 1974.

Until a clearer pattern emerges, I must assume that we may sell less in the UK in 1974 than we did last year and that, with continued price controls, some reduction in our UK earnings is probable. However it will take a severe and prolonged recession to reduce our UK earnings substantially. Over 40% of our UK business is in gases where all our tonnage contracts contain minimum payment clauses and where we should be able to rely on a continuing high level of rental income from the cylinder trade. Of the UK business other than gases, a considerable proportion is in exports which we would expect to increase—or, at the least, to be maintained.

Moreover, unless conditions should prove exceptionally bad on a worldwide scale, I expect any shortfall in UK earnings to be made up by increased earnings abroad. Earnings from abroad, however, do not make a corresponding contribution to our UK cash resources and it is here that pressures might be felt during the next twelve months. We do not wish to have to postpone any of our plans for expansion, especially in the faster growing parts of the Group's business, but, if necessary, we shall do so. We are carefully examining the various alternative lines of action available to us, which must take into account the cost of our minority stake in Airco Inc., USA and possible future developments thereof. In order to extend the boundaries of our financial planning, we intend to request the approval of shareholders to changes in the Company's Articles to increase and modernise the Company's borrowing powers and to increase the Company's authorised capital. These proposals will be put to shareholders at an Extraordinary General Meeting which will follow our Annual General Meeting on 21st March.

The negotiations to acquire a substantial interest in the Airco corporation of the USA, one of the three major American industrial gas companies, were conducted in difficult circumstances. During the previous few months we had been discussing with Airco the possibility of linking our two companies, when an unexpected bid was made for Airco stock by the Curtiss-Wright Corporation. This intervention forced us to take immediate action if the opportunity for entering the US market was not to be lost. We now have a holding of over one-third of the common stock of Airco and a base in the United States from which to study future strategy and tactics. There could be no more appropriate evidence than this of your Board's determination to pursue its long-term objectives as far as present difficulties at home may permit. We remain convinced that our Group's future lies in the increased scale of its international operations—especially for the 'core' business of industrial and medical gases with their related equipment.

Gas is not a readily exportable product and the only way fully to exploit our technological and managerial skills and knowledge is by the establishment of production units wherever and whenever a profitable opportunity occurs in the world. By so doing, we can earn good marginal returns from skills already developed and knowledge already gained. In addition, we attach the Group to national rates of growth which, unhappily but usually, exceed that of the UK.

At the same time we provide ourselves with a substantial measure of security for the future, for I cannot believe that the 'no growth' concept now being aired in the UK will appeal to that larger part of the world which still goes without an adequate supply of the necessities of life. To most countries the need for increased wealth is obvious and immediate; it is a need to which BOC is ready and able to make a valuable contribution.

In terms of competitive power, particularly in gases, the world is now the stage. Markets are increasingly dominated by large companies all of which are established on an international scale or have ambitions so to be. We are well placed to defend ourselves in these circumstances and shall continue to increase and strengthen our bridgeheads.

A policy of increased international operation inevitably carries its own political, economic and social risks. We believe that our experience over many years has enabled us to assess those risks with reasonable accuracy and to evolve a code of company behaviour which is normally found acceptable by the host government and community. Fundamentally, that behaviour is based on a proper respect for the national pride, law and purpose of the country in which we operate. We aim at a high standard of behaviour in our own country and seek nothing less elsewhere.

This statement has been difficult to make because of the knowledge that every day could bring some new and unpredictable development which could affect the BOC Group and its future. I have tried, therefore, to deal briefly with some of the strengths of our present and future position in the firm belief that they will be found to have outlasted any temporary upsets in world economic affairs.

In this context, there is one other factor of fundamental strength to which I must refer, the skill, energy and loyalty of the people who work for the Group throughout 37 countries. In expressing thanks to them all I would particularly like to mention our people who have retained their Group loyalty despite unusual pressures and difficulties in Northern Ireland, in Rhodesia, in India, in Pakistan and now, for the time being at least, in Britain itself. Insofar as it lies within its power the BOC Group Board will return that loyalty in full measure in the future, as it has in the past.

L. E. Smith

London
25th February 1974

Report of the Directors

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The Directors submit their report and statement of accounts for the year ended 30th September 1973. The Group profit and loss account is summarised thus :

		£'000
Group profit attributable to parent Company		11 382
Add Extraordinary items (net), after tax		1 080
Disposable profit		12 462
Preference dividend		95
Ordinary dividends		
Interim of 0.805p per share (paid October 1973)	1 638	
Proposed final of 1.4p per share (payable March 1974)	2 849	
		4 487
Profit retained		7 880
		12 462

Group Profits

Both sales and Group trading profits increased by 26% compared with the previous year, representing an annual growth rate in Group profits of 16% over the past five years. The utilisation of our resources also improved and the return on average capital employed increased from 13.5% to 14.5%, the highest since 1960. The growth in earnings per share continued although, under the imputation tax system introduced during the year, this indicator is no longer strictly comparable with past years.

UK/Europe trading profit improved by almost 20%, but much of this increase was absorbed by higher interest charges on increased borrowings and by development and research, both of which arise in the UK, although incurred on behalf of the Group worldwide.

Overseas profits show a 33% increase over last year, but the comparison is distorted by the substantial benefit from changes in exchange parities during the year which accounted for £3.2 million of the improvement. If this factor is excluded, overseas profits increased by 13%.

Taxation and Dividend

The introduction of imputation tax under the Finance Act 1972 represents a fundamental change in our UK tax system, particularly with regard to the effect on dividends. Some shareholders may still be unfamiliar with the new form in which dividend is expressed.

Previously the Company was obliged to deduct tax from dividends at source. Under the imputation tax system the shareholder will receive the dividend as declared and will normally be entitled to a tax credit from the Inland Revenue of 3/7ths of the dividend received. Thus, the recommended total dividend of 2.205p per ordinary share, together with the tax credit available, represents a 5% increase on the dividend paid last year. This is the maximum which can be paid under the Government's counter-inflation regulations. Largely due to the imputation tax system, the cover for ordinary dividend, based upon profit before extraordinary items, has increased from 1.7 to 2.5 times.

Property Revaluation

Although the value of UK properties has been reviewed from time to time, your Directors decided this year to reflect in the accounts of the UK Companies the valuation made at 30th September 1973 in order that the Balance Sheet should be brought more closely into line with current values. The total increase in value was £20 million, of which £14 million was transferred to Capital Reserves, the balance of £6 million being taken to Deferred Taxation to meet the liability arising if the properties should be sold.

Borrowing

Borrowings increased by £18 million during the year, largely in support of our capital expenditure of £30 million, of which just over half was spent overseas.

Report of the Directors *(continued)*

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General

A detailed comment follows on the performance of our UK/Europe divisions and overseas companies. Since the end of the financial year we have witnessed the crises in the price and supply of energy, both on a national and international scale, the threat of world shortages in many important raw materials, a further rise in interest rates and uncertainty in the foreign exchange markets. These matters will have profound effects, not only on British industry, but also on the economies of many other countries. For these reasons this report, whilst recording the activity of the past year, can provide few guidelines to probable results in 1974.

Gases Division

The resurgence in UK industrial activity during the year to September 1973 helped to increase the sales of many of the principal products of Gases Division. These additional sales, plus continued pressure to reduce operating costs, have resulted in improved profit performance. But most of the markets in which the division sells are highly competitive and most of our prices have fallen in real terms since the introduction of the CBI initiative on prices in 1971.

A new hydrogen plant was successfully commissioned at Newport to supply British Steel and Monsanto. Further new production units are under construction at Motherwell and Widnes and also in Ireland. In continental Europe our Danish carbon dioxide business continues to operate well.

The division has also contributed to the hospital building programme by the installation of oxygen and nitrous oxide pipelines in major hospitals.

Our marketing activity has concentrated on the investment of resources to develop new applications for our products, resulting in above average rates of growth being stimulated in some areas. In particular, the application of nitrogen in food freezing went well and there now also appears to be considerable scope for the use of oxygen in the treatment of industrial and municipal wastes.

New activities include the setting up of a number of separate small businesses developed from our knowledge of product applications. For example we are now operating a service for the cryogenic grinding of certain polymers, a hole boring service based on the oxygen thermic lancing process and the exploitation of new techniques for nitrogen inerting using special foams.

Offshore industries

We have vigorously explored ways open to the Company to participate in the North Sea oil activity outside, as well as within, the traditional fields of industrial gas. As a result we have made a small number of initial investments in services and supplies. Further developments are expected in the current year as our effort in this direction builds up.

At the same time we have built a new industrial gas branch in Aberdeen and re-organised our business in Inverness and Lerwick to meet the needs of the offshore oil industry.

Cryoplants Limited

Cryoplants had an active year obtaining new business from third parties and entering six new overseas markets. Currently we have contracts in all continents.

The primary function of supplying the BOC Group with air separation plants has continued and these include plants for Gases Division to be installed at Motherwell and at Grangemouth.

The second liquefied natural gas (LNG) peak-shave plant for the Gas Council—this one at Partington, Chesnire—has been installed and two further plants are currently being built.

Welding Products Division

The year started under slack trading conditions, and the long expected recovery was not experienced until the second half of the year when there was a rapid increase in business throughout the division. Unfortunately full advantage could not be taken of the improvement because of the difficulty in obtaining certain raw materials, particularly steel for the important welding consumables section, and certain key components.

Sales of semi-automatic equipment increased by about 40%. There were similar increases in orders for the capital equipment sections—cutting machines and automatic welding equipment—but the benefits will not accrue until 1974.

Exports have improved, helped by the exchange rate.

In Europe, Smit Weld has continued to develop satisfactorily in spite of setbacks caused by industrial problems amongst some of its major customers in the Netherlands.

In product development, the year has been mainly one of consolidating technological advances, although important improvements have been introduced in a number of products.

Of great importance was the acquisition of the Hancock cutting machine division of G D Peters & Co Ltd along with Hancock Brennschneid-Automatik GmbH in Germany, which became part of the Group on 1st October 1973. The Hancock and BOC ranges of cutting equipment are largely complementary, and the new arrangement will enable us to compete more effectively in many markets.

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International Co-ordination (Welding Products) Limited

The growing demand throughout the world for access to new welding technologies, and the increasingly international attitude of our competitors, has underlined the need for effective co-ordination within the BOC Group to exploit our world strengths in the manufacture, marketing and development of welding equipment and consumables.

A non profit making company, International Co-ordination (Welding Products) Ltd was incorporated in June for this purpose, the shareholders being those companies in the Group with significant welding businesses, the turnover of which is over £70 million.

Group companies have collaborated enthusiastically in this new move.

Advanced Engineering

Edwards High Vacuum

In vacuum engineering and Cryoproducts (super-insulated containers and other equipment for handling very cold liquids), improvement in sales and turnover was achieved in spite of poor trading conditions earlier in the year—a period when we took the opportunity of installing more advanced machine tools to improve efficiency.

The New Year started with a record order book and there were further improvements in exports. All factories are now working to capacity apart, of course, from the exigencies of the three-day week in force in the UK at the time of going to press. The recently built Milan factory has had to be extended.

Our joint ventures in Japan (Nissan Edwards Shinku KK) and Brazil (Madef SA) have come up to expectations and are dealt with more fully in the overseas section of this report.

Medishield

The global market for medical equipment and supplies has been identified as a priority sector of the Group's business and is one which expanded satisfactorily during the year. A number of acquisitions were made which included: Medical Developments Ltd (manufacturers of the world-famous Manley ventilators); Viggo (Swedish-based manufacturers of high-quality disposable intravenous needles and rehabilitation equipment), a 12% equity stake (since increased to 17.3%) in AD International Ltd (dental equipment and supplies) and a 50% participation in Mediada (leading Swedish distributors of medical equipment). Since 30th September we have acquired George Ellison (Hospital Equipment) Ltd (manufacturers of hospital beds) and a 51% equity stake in Material Medico Quirurgico (distributors of medical equipment) in Spain.

The Medishield Corporation Ltd has been formed to integrate the Group's medical business internationally and to pursue actively the opportunities recognised in the medical equipment industry. With headquarters in London, its management structure will be decentralised so that local and national requirements can be given full consideration in marketing and manufacturing strategies and in research and development. Some Medishield products are illustrated on pages 32 and 33.

There are presently 15 subsidiary companies within Medishield, servicing all the major markets. In addition, Medishield have distributors in over 130 countries.

Chemicals Division

Operationally the acetylene plant at Maydown is now satisfactory but considerable difficulty is being experienced in obtaining feedstock. Butane is now being used successfully to supplement naphtha.

The worldwide shortage of crude tall oil has held back exploitation of our 50 000 tons a year fractionating capacity at Chester-le-Street, but despite this sales and profits improved.

The plant at Odda in Norway, for carbide and other products, again operated to capacity and achieved improved results. In the field of industrial relations the year was noteworthy for the introduction, under Norwegian law, of a nine-man 'Corporate Assembly'—six shareholder representatives and three employees elected by ballot.

A major development which took effect on 1st October 1973 was the acquisition, from Albright and Wilson, of their sulphur dioxide and derivatives business with sales of £3 million a year. The plant is at Bromborough in Cheshire and, with a management team strengthened from BOC, is already well integrated into the division.

Metals Division

The division benefited from the higher tempo of industrial activity with improved volumes in all areas, but profits were still difficult to make at Murex and HSSA. Our small business in melted aluminium alloys (Blackwells) has been strengthened in the year by the purchase of the complementary business of Anglo Metallurgical Ltd.

Deloro Stellite at Swindon had a year of difficult industrial relations. The management has been strengthened and better results are anticipated in 1974. The Deloro factory at Koblenz has not yet achieved satisfactory profits but progress is being made. After the year's end the largest Stellite hard-facing business in Spain, now named Deloro Stellite Iberica, was acquired.

The Production Tool Alloy business has made good progress with the consolidation at Sharpenhoe, Bedfordshire, of the previous Murex and PTA businesses in hard metal. The sintered magnet business also had a good year.

Report of the Directors *(continued)*

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Consumer Products Division

Despite world shortages and rapidly rising costs of many basic foods, both sales and profits of our food-based companies improved significantly.

The Winchester Frozen Foods freezer-food retail chain currently consists of twelve shops in the Hampshire/Berkshire area. During the year the central distribution cold store was extended and twelve new shops are planned during the coming year to take advantage of the fast growth of this relatively new market.

J Muirhead and Ace Refrigeration also increased their shares of the expanding UK markets for bulk frozen foods and domestic freezers respectively.

Production capacity of King Harry Foods at Thame, Oxfordshire, was more than doubled to meet the home demand for pizzas and work is now in progress on factory and office extensions to enable us to exploit the full market potential for these and other new frozen products.

Sparklets International was, for most of the year, within the overall management of the Advanced Engineering Division but became part of Consumer Products when that division was formed towards the end of the year. Sparklets showed excellent improvements in sales and especially profits.

Batchelors of Ireland benefited from its increased production capacity for soft drinks and profits improved despite a squeeze on margins. However, it has been increasingly clear that, whilst the prospects for Batchelors were good, its business did not readily fit into the BOC food services portfolio. During the year talks took place with the Beecham Group and in December 1973 that company acquired BOC's 100% interest in Batchelors for a cash payment of £2·7 million the change being effective from 1st October 1973.

BOC believes that Beecham's existing range within the Irish market place will provide a favourable climate in which Batchelors should continue to flourish.

BOC Transhield Group

Transhield's specialised food distribution service for Marks & Spencer was further developed this year with major extensions and modifications carried out at four depots. Management has been strengthened and the close co-operation and trust between our two companies has ensured the success of this venture and its value to both parties. Further expansion in both the scale and flexibility is envisaged.

General haulage, which has had a relatively difficult year, is also being developed, as are the Transhield group's small but growing interests on the Continent.

Overall consolidation and expansion produced a satisfactory year.

Overseas companies

Group companies outside Europe maintained an encouraging growth pattern during the year as can be seen from the following—

	1972/73	*Growth*
Sales	£141 934 000	up 30.3%
Trading profits	£21 326 000	up 32.8%

£21 million of sales turnover and £3 196 000 of the trading profit figure was due to the hardening of foreign currencies against sterling.

Eighty per cent of the overseas trading profits come from the four largest companies, in Australia, South Africa, India and Canada, whose managing directors, together with the UK managing directors and the Group chairman, make up the informal organization known as BOC International which meets twice yearly to discuss policy, opportunities and mutual problems.

In the figures which follow, conversions to sterling have been made at rates ruling on 30th September 1973.

Australia (Commonwealth Industrial Gases)

Sales	$79 806 000 (£49 263 000)	up 13.5%
Operating profit	$12 853 000 (£7 934 000)	up 12.7%

The second half of the year saw a rapid recovery from the depressed conditions of 1972 and CIG's position was strengthened in most of its fields of activity.

During the year, some £7 million capital expenditure was devoted to meeting the continuing growth in demand for the Company's main products. This included additional nitrogen and carbon dioxide plants to supply the food and chemical industries, a new liquid helium storage facility and a sulphur dioxide production unit. CIG is co-operating closely with municipal authorities in the use of oxygen and other gases for environmental control and waste disposal.

CIG's sales of welding and medical equipment benefited from the progressive improvement in the Australian economy. Good progress was also made in market penetration through the recently acquired industrial safety equipment activity Exiss Holdings Pty. Ltd.

CIG exported over 3 500 of their Transarc electric welding machines to BOC Group companies. This design has now been adopted as standard for the Group.

Good progress was made by Thai Industrial Gases, whose plants are now running at full capacity. In Indonesia, the joint venture company's works at Jakarta came into operation and is now producing oxygen, nitrogen, acetylene and carbon dioxide for the West Java market to meet the growing demand from newly established industries.

Report of the Directors *(continued)*

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South Africa (African Oxygen)

Sales	R80 071 000 (£49 426 000)	up 6.6%
Operating profits	R7 934 000 (£4 897 000)	up 10.3%

From the above figures it will be seen that the African Oxygen Group improved its results substantially in 1973 following an upturn in the economy and despite increasing cost inflation. Afrox Limited maintained its market share during a year in which demand for industrial gases was at a high level. The substantial subsidiary, Dowson & Dobson, which specialises in the supply of mining and engineering equipment, also had a good year and progress was made in reorganising the smaller subsidiary companies.

Arrangements have been made for the sale and lease back of certain Afrox tonnage oxygen plants.

Dowson & Dobson has taken an equal share with the Aluminium Company of Canada and Foote Mineral Company of the USA in a new venture, Silicon Smelters (Pty) Limited, to produce 30 000 tons a year of high grade silicon metal for the world market from a deposit of high purity quartz, owned originally by Dowson & Dobson, with reserves for 20 years. Plant and equipment is expected to cost about R17 million (£10.5 million).

Continuing steps have been taken by the Board and management of the African Oxygen Group to reduce the gap which exists between the earnings of workers of various ethnic groups. This is coupled with a policy of improving productivity through progress in education and training and in communications through works councils.

India (Indian Oxygen)

Sales	Rs256 571 000 (£13 713 000)	up 8.6%
Operating profit	Rs28 683 000 (£1 533 000)	up 6.6%

These results were achieved despite many hindrances to progress during the year. IOL activity was adversely affected by power shortages (now much improved since the monsoon), raw material shortages—particularly steel and carbide—and by continued restriction by the Government of India on expansion in its traditional businesses.

Throughout the year, much effort was devoted to seeking opportunities for diversification; a number of export-orientated projects have been identified and are now being actively pursued.

An important development was the setting up of a new activity in Calcutta for the manufacture of small oxygen-producing plants of up to 12 tons a day capacity. Already this has succeeded in winning orders for the next three years.

Canada (Canadian Oxygen)

Sales	$32 869 000 (£13 526 000)	up 17.2%
Operating profit	$3 241 000 (£1 334 000)	up 39.7%

The Canadian economy expanded markedly in 1973 and in the prevailing conditions Canox had an excellent year particularly in the industrial and medical fields, combined with the improved activities of Deloro and Arcweld.

Bangladesh

The Bangladesh Government has released the assets of the former eastern region of Pakistan Oxygen to a new company, Bangladesh Oxygen (BOL) in which BOC holds 60%. BOL traded profitably during 1973.

Brazil

Good progress was made during the year in the development of operations in this country, whose rapidly expanding economy offers great potential opportunity in several of our main activities.

Arrangements were concluded with Companhia Siderúrgica Hime for a joint venture, Hime Gases Industriais, to manufacture and market industrial gases and related equipment. BOC has a 49% interest in the new company. Trading is expected to start in mid 1974.

Madef SA is an engineering company in Porto Alegre, in which BOC has a 41% interest. Its main activity is industrial refrigeration plant in which it is a market leader; it also sells Edwards High Vacuum products and has started to manufacture production plant and cryogenic storage vessels for Hime Gases Industriais. Madef sales and profits improved substantially during the year. Since the year's end a 75% interest has been acquired in Soltronic/IEG SA, a São Paulo company, manufacturing resistance and semi-automatic welding equipment, which already has an established market position in supplying the fast expanding Brazilian automotive industry.

East Africa

East African Oxygen, with operations in Kenya, Tanzania and Uganda, maintained steady progress despite difficulties in Uganda. In all three territories, important advances have been made in training and promoting African staff to more senior management positions. Operating profit at £K406 000 (£487 000) was 1.7% above last year.

Japan

Nissan Edwards Shinku KK, our joint venture company with Nippon Sanso, came up to expectations and sales in this territory are growing, but the Company has not yet reached the point of profitability.

Report of the Directors (continued)

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New Zealand

Demand for all NZIG's main products was buoyant throughout the year and the performance of the newly acquired carbon dioxide activity made a satisfactory contribution to profits. This, together with the rising demand for nitrogen, provides promising growth areas for the future.

The substantially increased volume of sales enabled NZIG to make improved profits in spite of the continuing pressures on costs and stringent price control regulations.

Sales at $14 167 000 (£8 691 000) were 17.7% above last year; operating profit at $1 913 000 (£1 174 000) was up 22%.

Nigeria

The satisfactory progress of our trading activities was maintained. Increased facilities for oxygen and nitrogen have been installed on a new factory site in the Lagos area.

Pakistan

Despite recent widespread floods, POL had a very good year. Sales at Rs25 million (£1.1 million) were 21.3% up on last year and have largely made good the loss of the former eastern region turnover. Operating profit at Rs4 545 000 (£192 000) was 57.5% up on last year and is a record for the company.

Singapore and Malaysia

SOL and MOL, our two companies here, produced a combined trading profit of £1.0 million, on sales of £4.5 million. Despite increased competition in both these territories, growth continues at a satisfactory rate and substantial additional plant is being installed to keep pace with anticipated increased demand for oxygen, nitrogen and carbon dioxide.

Sri Lanka (Ceylon)

Our company here is experiencing very difficult economic conditions. In all the circumstances results were satisfactory, although the return was small.

Zambia

Zamox trading was affected by shortages of imported raw materials and industrial goods resulting from the closure of the border with Rhodesia. In the circumstances, the 9% reduction in operating profit was in line with expectation.

New Venture Secretariat

Our approach to technical innovation through new business ventures is proving successful and has been developed further during the year.

Cryogenic Refrigeration Systems have extended the scope of their high-speed gas-bearing turbine systems to smaller standard liquefiers/refrigerators—the TurBOCool series. These are the only commercial systems on this scale using highly reliable expansion turbines. Through our agreement with Cryogenic Technology Inc, we have installed our first turbine in the USA at the Argonne National Laboratory where it is performing satisfactorily.

Following the development of improved techniques for underwater welding (with support from the Department of Trade and Industry) we have now set up, in collaboration with HydroTech International of Houston, USA, two companies to offer a worldwide high quality underwater welding service. They are SubOcean Services Ltd, London, and SubOcean Services Inc, Houston. Our divers have already carried out successful contract repair work in the North Sea, the Mediterranean and off the coast of Nigeria.

Our Industrial Laser Systems venture has been installed in a new factory at Daventry. To supplement the 2kW gas laser systems for cutting and welding applications, we have now developed, and are manufacturing and selling, a number of solid state laser systems for materials working, such as resistor trimming and diamond drilling. With lasers at Daventry and our electron beam welding activity at Crawley, we can now offer a strong capability in the use of high-energy beams for materials working.

Computer Services

The BOC Computer Centre doubled its non-BOC business for the second year in succession and continued to make satisfactory profits. It is well placed in the fastest growing sector of the computer services market, namely the provision of computer power over telephone lines, thus providing computer users with an alternative (at lower cost for greater power) to the installation of their own in-house computer.

Appraisal of the external opportunities for investment in the computer services market led to the acquisition of an interest in Triad Computing Systems Ltd, and to negotiations (since successfully concluded) to purchase the computer bureau business of Datasolve International Ltd. We expect both these investments to show profitable results in 1974.

Management Development

Maintaining our rate of profitable growth has continued to make strenuous demands on our management teams. One focus of our management development effort in 1973 has been the strengthening of professional support in every field and the increased encouragement to managers to organise and run their businesses in ways

Report of the Directors *(continued)*

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that motivate employees to give of their best. Another has been our continued effort to broaden the scope of managerial opportunities by the movement of managers within the Group. About 25% of our internal transfers and promotions have been inter-divisional.

The extended facilities of our training centre at Chartridge have enabled us to sustain a high level of complementary 'off-the-job' activity, ranging from the induction of new graduates to marketing and other special conferences drawing international attendances from many parts of the Group.

We have made special efforts to provide post-qualification training facilities for accountants and computer staff, and have established good relationships with professional institutes and business schools for these purposes.

Pensions

During the year we have worked on the revision of our pension schemes, thus anticipating future legislation. From 1st April 1974 two new Company schemes applicable to UK based employees, distinguished only by different rates of contribution and by benefits differing according to those contributions, will be set up. All existing employees will be able to choose between these schemes.

At the time, for existing pensioners, widows and those deferred pensions we intend to guarantee a minimum growth rate of pension entitlement and this will be applied every year.

A comprehensive communications exercise has been mounted to explain the new schemes to all our UK employees and our aim has been to make certain that each and every one of them is aware of their personal position and of the options available to them.

Other matters of interest

It is always difficult in a brief report on the year's work to do justice to the many other events which have taken place, some of which may, in the long run, be of great significance. No list can be comprehensive but a few matters of interest are recorded here:

The Group Strategy Office has made a good start on the studies necessary to advise on future Group policy. Mr Paul Bosonnet has been appointed Director of Group Strategy in succession to Mr Michael Shanks who left BOC to become Director General for Social Affairs in the EEC.

We have experimented successfully with flexible hours for the staff of some of our offices; we have also made some progress in more effective two-way communications with our employees.

Several members of the Group operate successful scholarship schemes designed to help existing employees with further education and specialist training. We have also introduced through Medishield two research fellowships, value £4 000 each, to enable overseas anaesthetists to study the practice of anaesthesia in the UK for a year.

Our efforts to provide all units of the Group with an effective corporate identity, notably manifested by our red and white stripes but also by a steady improvement in the design of our products, have been recognised by a Presidential Award for Design Management presented by HRH the Duke of Edinburgh.

Directors' interests

The Register kept by the Company for the purpose of Section 27 of the Companies Act 1967 shows that the number of Ordinary shares of the Company in which the Directors of the Company and their families had an interest as at 1st October 1972 and 30th September 1973 were as follows:

Ordinary Shareholdings

	30/9/73	*1/10/72*
Beneficial		
Mr L E Smith	1 000	*1 000*
	*55 000	**55 000*
Sir Geoffrey Eley	15 595	*15 595*
Sir John Cowley	3 200	*3 200*
Lord Elworthy	2 000	*2 000*
Mr I J Fraser	5 000	*5 000*
Sir Owen Wansbrough-Jones	5 280	*5 280*
Mr P Laister	1 000	*1 000*
	*45 000	**45 000*
Mr J M Williams	2 000	*2 000*
	*45 000	**45 000*
Mr R C Hesketh-Jones	4 042	*4 042*
	*45 000	**45 000*
As trustee		
Sir Geoffrey Eley	19 080	*26 464*
Mr R C Hesketh-Jones	1 800	*2 009*

Notes

1 All ordinary shares are fully paid unless marked with an * which are 5% paid.

2 No Director has a beneficial interest in any debentures or preference shares of the Company or in any shares or debentures of any subsidiary company.

3 No Director has had any material interest in any contracts with the Company or its subsidiaries.

4 There have been no changes in the Directors' interests between 30th September 1973 and 28th January 1974.

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Report of the Directors *(continued)*

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Directors and Auditors

The Directors are named on page 4. The Directors retiring by rotation are Mr L E Smith and Lord Elworthy, who are willing to be re-appointed.

The Auditors, Coopers & Lybrand, will continue in office in accordance with the provisions of Section 159 (2) of the Companies Act 1948.

Interests in Company's share capital

So far as can be ascertained no one person or corporation holds or is beneficially interested in any substantial part of the share capital of the Company.

Charitable and political contributions

During the year ended 30th September 1973 Group companies in the United Kingdom made charitable and educational payments totalling £32 000. In accordance with long established practice no political contributions were made by the group in the UK.

Exports

The value of goods exported by the Group from the United Kingdom was as follows:

	£'000
to BOC companies	5 473
to others	16 954
	22 427

Profits earned from overseas investments, after allowing for local taxation and the interests of minority shareholders, totalled £7 364 000 for the year.

Employees in the UK

Average number employed 20 280
Aggregate remuneration £41 114 000

By order of the Board
C A B Leslie
Secretary

London
25th February 1974

Report of the Auditors

To the Members of
The British Oxygen Company Limited

In our opinion, based on our examination and the reports of the auditors of certain subsidiary and associated companies not audited by us and on the unaudited management accounts of some associated companies, the accounts set out on pages 15 to 27 together give a true and fair view of the state of affairs at 30th September 1973 and of the profit for the year ended on that date and comply with the Companies Acts 1948 and 1967.

Coopers & Lybrand
Chartered Accountants

London
25th February 1974

Accounting principles

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1 Fixed assets

(a) United Kingdom investment grants are deducted from the cost of the assets.

(b) UK regional development grants are treated as deferred credits pending transfer to profit and loss account on a basis which fairly reflects the benefit over the expected useful life of the asset.

(c) Depreciation is calculated to write off the assets (other than certain tonnage plants) during their expected normal lives by equal annual instalments (the straight line method) at rates ranging from 2½% to 25% per annum depending upon the type of asset. Depreciation on tonnage plants commissioned in the United Kingdom since 1st October 1969 is calculated on an annuity basis. No depreciation is charged on freehold land.

(d) Specific provision is not made for the replacement of fixed assets but, in the opinion of the directors, depreciation, profits retained and borrowing facilities available are adequate for this purpose.

2 Stock and work in progress

Stock and work in progress is valued at cost or net realisable value whichever is lower, and cost where appropriate includes a proportion of overhead expenses. Profits are not taken on major construction contracts until completion but provisions are made for all known or anticipated losses.

3 Debtors

Known bad debts are written off and specific provision is made for any considered to be doubtful of collection. In addition, general provisions of 1% to 2½% are made on the balance of trade debts.

4 Deferred taxation

The Group provides for tax on the excess of the capital allowances given for tax purposes over the depreciation provisions charged in the accounts, this excess being reduced by expenditure not allowed for tax until later years.

The UK Advance Corporation Tax on current dividends which will be offset against future Corporation Tax payments has been deducted from the Deferred Taxation account.

On a revaluation of fixed assets, provision is made for the tax liability which may arise if the assets are sold at the values stated in the balance sheet.

5 Development and research expenditure

Group expenditure (which comprises the costs of operating the development and research centres, United Kingdom and overseas, inclusive of appropriate overheads) is written off when incurred.

6 Trading profit

It is policy to arrive at trading profit reflecting normal trading conditions and to show separately:

(a) extraordinary profits and losses arising during the year,

(b) capital profits and losses.

7 Associated companies

The Group share of profits less losses in associated companies is consolidated where the Group interest is between 20%–50% and the investment is for the long term and material. Companies so consolidated are listed on page 22.

Where audited accounts are not co-terminous with those of the Group, the share of profits less losses has been arrived at from the last audited accounts available and unaudited management accounts to 30th September.

8 Investment income

Income from investments, other than those consolidated as associated companies under note 7 above, is included in trading profit only if received, or declared and receivable.

9 Exchange rates

All currency figures are converted at the rates of exchange ruling at the financial year end: Profits and losses arising on trading are dealt with through the profit and loss account. Profits and losses arising on opening net asset position have been taken to reserve in order not to distort the profits of the year.

10 Sales

Sales are based on invoiced value, excluding VAT and inter-company sales.

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Consolidated profit and loss account

CX-292-R

	NOTES	1973	1972
		£'000	£'000
Sales		319 123	252 589
Group trading profit, including associated companies	1, page 18		
United Kingdom and Europe		20 943	17 476
Overseas		21 326	16 054
		42 269	33 530
Less development and research		3 380	2 631
		38 889	30 899
Less interest paid	3, page 18	10 511	8 440
Group profit before tax		28 378	22 459
Less taxation	4, page 18	13 938	9 864
		14 440	12 595
Less attributable to minority shareholders		3 058	2 240
Group profit attributable to parent company		11 382	10 355
Add extraordinary profits (losses)—net, after tax	7, page 19	1 080	(110)
		12 462	10 245
Add transitional credit for notional Advance Corporation Tax		—	902
Disposable profit	8, page 19	12 462	11 147
Dividends:	9, page 19		
Preference	20, page 24	95	122
Ordinary: interim 0.805p (*1972: 1p gross*)		1 638	2 035
proposed final 1.4p (*1972: 2p gross*)		2 849	4 070
		4 582	6 227
Retained profit		7 880	4 920
		12 462	11 147
Earnings per ordinary share	10, page 19	5·55p	5·03p

Balance sheets 30th September 1973

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PARENT 1973	PARENT *1972*		NOTES	GROUP 1973	GROUP *1972*
£'000	*£'000*			£'000	*£'000*
81 276	*67 142*	Fixed assets	*11, page 20* *12, page 21*	191 572	*151 520*
70 068	*62 302*	Subsidiary companies	*13, page 21*	—	—
4 369	*1 819*	Associated companies and investments	*14, page 21*	11 582	*6 523*
53 725	*50 641*	Current assets	*15, page 22*	174 518	*141 801*
209 438	*181 904*			377 672	*299 844*
44 587	*41 527*	*Less* current liabilities and provisions	*16, page 22*	113 528	*94 362*
164 851	*140 377*			264 144	*205 482*
		Financed by:			
50 879	*50 879*	Issued ordinary shares of BOC	*20, page 24*	50 879	*50 879*
8 188	*8 188*	Share premium		8 188	*8 188*
26 320	*14 587*	Reserves	*21, page 24*	63 916	*35 084*
85 387	*73 654*	Ordinary shareholders' interests		122 983	*94 151*
2 500	*2 500*	Issued preference stock of BOC	*20, page 24*	2 500	*2 500*
—	—	Minority shareholders' interests		26 736	*20 771*
13 310	*8 289*	Deferred taxation		21 482	*12 738*
62	—	Regional development grants		97	—
101 259	*84 443*			173 798	*130 160*
42 425	*38 675*	Long term loans	*17, page 23*	62 375	*53 058*
21 167	*17 259*	Short term loans	*18, page 23*	27 971	*22 264*
164 851	*140 377*			264 144	*205 482*

Signed on behalf of the Board:

L E Smith *Director*

Geoffrey Eley *Director*

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Notes on accounts

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CONSOLIDATED PROFIT AND LOSS ACCOUNT

	1973 £'000	*1972 £'000*
1 Group trading profit is after charging :		
Depreciation—United Kingdom and Europe	10 369	*9 361*
Overseas	7 950	*5 853*
	18 319	*15 214*
Pension and provident funds contributions	4 386	*3 320*
Audit fees (parent company £80 000, including prior year adjustment)	390	*289*
Emoluments of directors of parent company		
As directors	8	*8*
For management *note 5, page 19*	139	*144*
Payment to past directors and dependants of past directors of parent company	33	*24*
and after crediting :		
Share of profits of associated companies	891	*799*
Other investment income received and receivable	131	*25*
2 Investment income		
Total investment income (including that from associated companies) dealt with in the accounts in accordance with schedule 2 para 12(g) of the Companies Act 1967—quoted	74	—
unquoted	510	*317*
	584	*317*
3 Interest paid		
Bank loans, overdrafts and other loans repayable within five years	4 932	*4 273*
All other loans	5 579	*4 167*
	10 511	*8 440*
4 Taxation on profit of year		
United Kingdom—corporation tax at 45% (*1972: 40%*)	5 786	*2 641*
deferred taxation	1 522	*2 428*
	7 308	*5 069*
Reduced by—double tax relief	3 068	*1 914*
overspill relief	50	*50*
	4 190	*3 105*
Overseas—taxes	8 531	*6 195*
deferred taxation	997	*637*
Associated companies	387	*320*
	14 105	*10 257*
Less provisions for prior years no longer required	167	*393*
	13 938	*9 864*

The charge for deferred tax against 1973 UK profits has been calculated on the deferral basis and represents the effect of the net change in timing differences at the rate of tax applicable to the year (45%). (See note 4, page 15)

Notes on accounts *(continued)*

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	1973 £'000	*1972 £'000*
5 Directors' emoluments		
Chairman	26	*26*
1972 includes emoluments prior to appointment as Chairman		
	Number	*Number*
Up to £2 500	4	*5*
£5 001 to £7 500	—	*1*
£10 001 to £12 500	—	*1*
£12 501 to £15 000	1	—
£17 501 to £20 000	—	*3*
£20 001 to £22 500	3	—
£25 001 to £27 500	1	*1*

6 Senior employees' emoluments

	Number	*Number*
£10 001 to £12 500	9	*7*
£12 501 to £15 000	3	*1*
£15 001 to £17 500	1	*2*

7 Extraordinary items (net), after tax

	£'000
Profits less losses on sale of properties and other investments	1 000
Other items (net)	80
	1 080

8 Dividends from overseas subsidiary and associated companies

The unappropriated profits of overseas subsidiary and associated companies are liable to overseas taxes and United Kingdom taxation, subject to double tax relief, if distributed as dividends. There are exchange control restrictions in certain overseas countries on the remittance of funds to the United Kingdom.

9 Dividends

The 1973 dividends are payable under the imputation tax system introduced by the Finance Act 1972. A shareholder will normally be entitled to a tax credit of 3/7ths of the amount declared as dividend. Thus the total 1973 ordinary dividend of 2.205p per share is equivalent to a gross dividend of 3.15p per share under the former tax system (*1972: 3p*).

10 Earnings per share

	£'000
Group profit attributable to parent company	11 382
Less Preference dividend	95
Earned for 25p ordinary shares	11 287
Earnings in pence per share (net and nil basis)	5.55p

The ordinary shares ranking for dividend at 30 September 1973 and 1972 were 203 470 477. The 1973 earnings per share are based on the imputation tax system and are therefore not comparable with the previous year (*5.03p*) which were based on the former tax system.

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Notes on accounts *(continued)*

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BALANCE SHEET DETAILS

11 Fixed assets

GROUP	TOTAL	FREEHOLD AND LEASEHOLD PROPERTIES	PLANT AND MACHINERY	CYLINDERS	MOTOR VEHICLES	FURNITURE AND FIXTURES
	£'000	£'000	£'000	£'000	£'000	£'000
Cost or valuation 1/10/72	281 053	53 169	149 355 •	56 189	15 593 •	6 747
Exchange adjustment	22 202	4 763	10 148	6 139	700	452
New subsidiaries	754	558	139	—	19	38
Capital expenditure	30 116	5 086	13 840	6 706	3 771	713
Revaluations during year	12 685	12 587	64	41	*(2)*	*(5)*
Demolitions and sales	*(12 497)*	*(1 381)*	*(7 464)*	*(1 594)*	*(1 714)*	*(344)*
Cost or valuation 30/9/73	334 313	74 782	166 082	67 481	18 367	7 601
Depreciation 1/10/72	129 533	13 302	75 994	29 130	6 820	4 287
Exchange adjustment	9 647	1 011	4 822	3 206	328	280
New subsidiaries	191	59	92	—	12	28
Provided during year	18 319	1 499	10 276	3 794	2 164	586
Revaluations during year	*(7 986)*	*(7 871)*	*(53)*	*(47)*	*(8)*	*(7)*
Demolitions and sales	*(6 963)*	*(301)*	*(3 883)*	*(1 227)*	*(1 279)*	*(273)*
Depreciation 30/9/73	142 741	7 699	87 248	34 856	8 037	4 901
Net book value 30/9/73	191 572	67 083	78 834	32 625	10 330	2 700
PARENT						
Cost 1/10/72	130 040	16 164	80 063 •	22 876	7 989 •	2 948
Capital expenditure	9 567	664	4 953	2 481	1 229	240
Revaluation during year	6 485	6 485	—	—	—	—
Transfers from group companies	101	81	7	—	13	—
Demolitions and sales	*(4 526)*	*(138)*	*(3 069)*	*(619)*	*(605)*	*(95)*
Cost or valuation 30/9/73	141 667	23 256	81 954	24 738	8 626	3 093
Depreciation 1/10/72	62 898	5 183	40 970	11 405	3 364	1 976
Provided during year	6 888	489	4 134	1 288	774	203
Transfers from group companies	11	8	1	—	2	—
Revaluation during year	*(5 619)*	*(5 619)*	—	—	—	—
Demolitions and sales	*(3 787)*	*(61)*	*(2 696)*	*(482)*	*(466)*	*(82)*
Depreciation 30/9/73	60 391	—	42 409	12 211	3 674	2 097
Net book value 30/9/73	81 276	23 256	39 545	12 527	4 952	996

Opening balances marked • have been adjusted to reflect a change in asset category.

Notes on accounts (*continued*)

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11 Fixed assets (*continued*)

	PARENT	GROUP
	£'000	£'000
The net book value of leasehold properties at 30th September 1973 included above is:		
Long term	9 402	15 115
Short term	1 383	3 125
	10 785	18 240

12 Asset revaluation

UK freehold and leasehold properties of BOC and its wholly owned UK subsidiaries were revalued by Group Surveyor, Mr P W Baillie FRICS, at £38 922 000 on the basis of a sale with vacant possession between a willing buyer and a willing seller at 30th September 1973. This revaluation resulted in a surplus of £20 362 000 (parent company £12 104 000) which surplus has been transferred to capital reserves after provision for deferred tax at 30%.

An overseas company revalued its freehold land in 1970. This is included in freehold properties at £2 871 000.

13 Subsidiary companies

	1973 £'000	*1972 £'000*
Shares at cost and scrip issues at par, less amounts written off	23 167	*22 539*
Amounts owing to parent, including dividends since declared	52 250	*46 769*
	75 417	*69 308*
Less amounts owing by parent, less dividends since declared	5 349	*7 006*
	70 068	*62 302*

14 Associated companies and other investments

	PARENT		GROUP	
	1973 £'000	*1972 £'000*	1973 £'000	*1972 £'000*
ASSOCIATED COMPANIES CONSOLIDATED				
Shares at cost less amounts written off	—	*75*	956	*812*
Group share of post acquisition earnings, less goodwill on acquisition	—	—	1 217	*1 284*
	—	*75*	2 173	*2 096*
OTHER INVESTMENTS (including associated companies not consolidated)				
Equity interests at cost less amounts written off	3 222	*290*	4 399	*1 641*
Non equity interests	—	—	1 141	*117*
TOTAL EQUITY AND OTHER INTERESTS *see analysis overleaf*	3 222	*365*	7 713	*3 854*
AMOUNTS OWING TO PARENT OR GROUP (NET)	1 147	*1 454*	3 869	*2 669*
	4 369	*1 819*	11 582	*6 523*

Notes on accounts *(continued)*

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14 Associated companies and other investments *(continued)*

	PARENT		GROUP	
	1973 £'000	*1972 £'000*	1973 £'000	*1972 £'000*
The total equity and other interests are analysed between quoted and unquoted investments as follows:				
Quoted				
UK stock exchanges	2 731	*236*	2 960	*236*
other stock exchanges	280	—	292	*9*
	3 011	*236*	3 252	*245*
the market value of which is	*4 612*	*238*	*4 826*	*245*
Unquoted				
equity at directors' valuation	211	*129*	3 548	*3 492*
others at directors' valuation	—	—	913	*117*
	3 222	*365*	7 713	*3 854*

The following companies have been consolidated as associated companies (accounting principle 7 on page 15):

		% of Equity	Issued Share Capital £'000
UK	Thermit Welding (GB) Ltd	50	40
Brazil	Madef SA	41	776
Canada	Canadian Helium Ltd	33	37
Hong Kong	Hong Kong Oxygen & Acetylene Co Ltd	50	406
Nigeria	Industrial Gases Ltd	50	157
Spain	El Fresno SA	50	182
Sweden	Mediada AB	50	20
Zambia	Zambia Oxygen Ltd	49	1 290

15 Current assets

	£'000	*£'000*	£'000	*£'000*
Stock and work in progress	22 986	*20 967*	78 225	*64 651*
Debtors and payments in advance	30 071	*26 423*	84 781	*68 254*
Investment and regional development grants receivable	396	*1 669*	591	*2 186*
Tax reserve certificates	—	—	38	*12*
Deposits at short call	—	—	5 452	*1 729*
Cash and bank balances	272	*1 582*	5 431	*4 969*
	53 725	*50 641*	174 518	*141 801*

16 Current liabilities and provisions

Creditors and accrued liabilities	22 139	*18 465*	60 616	*47 277*
Bank overdrafts	10 881	*3 545*	25 048	*17 342*
Other loans repayable within one year	4 691	*12 915*	9 591	*14 300*
Taxation—United Kingdom	2 328	*441*	4 017	*2 279*
Overseas	61	*56*	9 769	*7 059*
Ordinary dividends—interim	1 638	*2 035*	1 638	*2 035*
proposed final	2 849	*4 070*	2 849	*4 070*
	44 587	*41 527*	113 528	*94 362*

The parent company bank overdrafts and other loans were unsecured. Of the group bank overdrafts and other loans, £1 002 000 and £1 407 000 were secured *(1972: £1 181 000 and £877 000)*.

Notes on accounts *(continued)*

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17 Loans—long term

	PARENT		GROUP	
	1973	*1972*	1973	*1972*
	£'000	*£'000*	£'000	*£'000*
5¾% Debenture stock 1981/86 : secured	7 395	*7 395*	7 395	*7 395*
6¾% Debenture stock 1985/90 : secured	6 130	*6 230*	6 130	*6 230*
8½% Tonnage Debenture stock 1988 : secured	6 000	*6 000*	6 000	*6 000*
8½% Tonnage Debenture stock 1990 : secured	7 500	*7 500*	7 500	*7 500*
11% Tonnage Debenture stock 1992 : secured	10 000	*10 000*	10 000	*10 000*
6% Loan 1978/80 : unsecured	—	—	1 317	*1 016*
7¼% Debenture stock 1983 : secured	—	—	1 302	*1 039*
7½% Debenture stock 1981 : secured	—	—	4 423	*3 530*
7¾% Debenture stock 1979 : secured	—	—	1 066	*850*
7¾% Debenture stock 1984 : secured	—	—	2 519	—
8¾% Debenture stock 1981/95 : unsecured	—	—	4 938	*4 103*
Other debenture and mortgage loans :				
secured	—	—	3 723	*2 543*
unsecured	200	*200*	389	*417*
These other debenture and mortgage loans are repayable over the years 1978 to 1998 and carry interest rates varying between 2¾% and 10½%				
	37 225	*37 325*	56 702	*50 623*
Bank borrowings repayable between 1st October 1978 and 31st December 1979 : secured	—	—	281	*380*
unsecured	5 200	*1 350*	5 392	*2 055*
	42 425	*38 675*	62 375	*53 058*

18 Loans—short term

		PARENT		GROUP	
		1973	*1972*	1973	*1972*
		£'000	*£'000*	£'000	*£'000*
Repayable during year to :	30th September 1975 (*1974*)	3 835	—	5 383	*816*
	30th September 1976 (*1975*)	6 082	*4 453*	7 784	*5 652*
	30th September 1977 (*1976*)	2 950	*7 535*	4 194	*9 183*
	30th September 1978 (*1977*)	8 300	*5 271*	10 610	*6 613*
		21 167	*17 259*	27 971	*22 264*

The parent company short term loans were unsecured. Of the group short term loans, £3 025 000 was secured (*1972: £2 822 000*).

19 Bank loans and overdrafts

The aggregate of bank loans and overdrafts included in notes 16, 17 and 18 above is :

Parent	£41 939 000	(*1972: £34 980 000*)
Group	£65 467 000	(*1972: £53 424 000*)

The parent company bank borrowings were unsecured.

Of the group bank borrowings, £3 533 000 was secured (*1972: £3 264 000*).

Notes on accounts (continued)

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20 Share capital

	AUTHORISED	ISSUED	
	1973	1973	1972
	£'000	£'000	£'000
Ordinary shares of 25p (fully paid)	50 868	50 868	50 868
Ordinary shares of 25p (5% paid)	223	11	11
Shares of 25p	6 409	—	—
	57 500	50 879	50 879
4.55% (formerly 6½%) Cumulative preference stock	500	500	500
3.5% (formerly 5%) Cumulative second preference stock	1 000	1 000	1 000
2.8% (formerly 4%) Cumulative second preference stock	1 000	1 000	1 000
	2 500	2 500	2 500

Under the Finance Act 1972, preference dividends payable after 5th April 1973 have been reduced to seven-tenths of their former gross rates. There will be a related tax credit equal to three-sevenths of the new rates shown above. Thereafter the related tax credit will depend on the rates prescribed in any subsequent Finance Act.

21 Movements in reserves during year

	PARENT	GROUP
	£'000	£'000
Capital		
Balance at 1st October 1972	3 915	4 786
Exchange profits	—	5 161
Retained (part of £7 880 000)	—	530
Surplus on revaluation of fixed assets (net of deferred tax)	8 500	14 572
Scrip issue by subsidiaries	—	242
Others	*(26)*	166
	12 389	25 457
Less goodwill on acquisition of subsidiaries	—	1 287
	12 389	24 170
Revenue		
Balance at 1st October 1972	10 672	29 014
Exchange profits	—	2 827
Retained (part of £7 880 000)	3 259	7 065
	13 931	38 906
Less scrip issue by subsidiaries	—	242
others	—	135
	13 931	38 529
Associated companies		
Balance at 1st October 1972	—	1 284
Exchange profits	—	93
Retained (part of £7 880 000)	—	285
	—	1 662
Less goodwill on acquisitions	—	213
disposal	—	232
	—	1 217
Total reserves	26 320	63 916

The reserves of overseas subsidiary and associated companies are liable to overseas tax and United Kingdom tax, subject to double tax relief, if distributed as dividends.

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22 Capital commitments

	PARENT	GROUP
	£'000	£'000
Projects for expenditure on capital account at 30th September 1973:		
against which orders had been placed	1 694	10 582
authorised by the Directors but not committed	16 271	23 549
	17 965	34 131

23 Contingent liabilities

The parent company has contingent liabilities amounting to £7 600 000 in respect of bank and other guarantees, £6.7 million of which relates to subsidiary company borrowings appearing in the consolidated balance sheet. In addition subsidiary companies have contingent liabilities of £511 000 in respect of guarantees to third parties.

24 Pension fund contributions

Two overseas subsidiary companies are under obligation to contribute to the Trustees of their Pension Funds sums totalling £161 000 per annum until 1975, the liability reducing thereafter to £5 000 per annum until expiry in 1988.

Group Companies

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The following list includes subsidiary and associated companies carrying on business, the results of which, in the opinion of the Directors, principally affected the amount of the profit or the amount of the assets of the Group.

Unless otherwise stated companies are held directly by The British Oxygen Company Limited, or through its wholly owned subsidiaries British Oxygen Investments Limited or BOC Holdings Limited, and the shares held are ordinary shares.

British Oxygen Investments Limited and BOC Holdings Limited are companies formed for the convenient holding of shares in certain subsidiary and associated companies.

In the UK the majority of the Company's business is transacted by its trading divisions trading as part of The British Oxygen Company Limited (BOC).

United Kingdom	%
The British Oxygen Company Limited	—
Ace Refrigeration Ltd	100
AD International Ltd	12
Anglian Industrial Gases Ltd	75
Anglo Metallurgical Ltd (a)	100
Arunta (Scotland) Ltd	75
Associated British Hospital Equipment Ltd	100
BOC Holdings Ltd	100
BOC Linde Refrigeration Ltd	25
BOC Nowsco Ltd	49
BOC Transhield Ltd	100
British Industrial Gases Ltd	100
British Oxygen Chemicals Ltd	100
British Oxygen Investments Ltd	100
British Oxygen Maydown Ltd	100
British Solvent Oils Ltd	100
Cryoplants Limited	100
Cyprane Ltd	100
Deloro Stellite (UK) Ltd (a)	100
High Speed Steel Alloys Ltd	100
Hirst Electronic (Holdings) Ltd	100
J Muirhead Ltd	100
Mealstream (UK) Ltd	75
Murex Ltd (a)	100
North Sea Marine Rig Services Ltd	100
Production Tool Alloy Ltd	100
Seaflame Company Ltd (a)	51
SubOcean Services Ltd	51
Thermit Welding (GB) Ltd (b)	50
Triple-E (UK) Ltd	80
Winchester Frozen Foods Ltd	100
Australia	
The Commonwealth Industrial Gases Ltd	59
Bangladesh	
Bangladesh Oxygen Ltd	60
Brazil	
Hime Gases Industriais Ltda (b)	49
Madef SA (b)	41
Canada	
Canadian Oxygen Ltd	100
Canadian Helium Ltd	33
Edwards High Vacuum (Canada) Ltd	100
Fraser Sweatman (Canada) Ltd	100

Denmark	%
A/S Kulsyre & Tørisfabriken 'Union' (b)	100
Nordisk Kulsyrefabrik A/S (b)	94
Fiji	
CIG Fiji Ltd (b)	55
Germany	
BOC Deutschland GmbH	100
Hong Kong	
British Oxygen (Hong Kong) Ltd	100
Hong Kong Oxygen & Acetylene Co Ltd (b)	50
India	
Indian Oxygen Ltd	66
Indonesia	
P.T. Industrial Gases Indonesia (b)	65
Ireland	
Batchelors Ltd (a) (c)	100
BOC Northern Ireland Ltd (b)	75
Irish Industrial Gases Ltd	75
Italy	
Edwards Alto Vuoto SpA	100
SACCAB SpA	100
Jamaica	
Electric Arc (Jamaica) Ltd	76
Japan	
Nissan Edwards Shinku KK	50
Kenya	
East African Oxygen Ltd	89
Malaysia	
Malayan Oxygen Sdn Berhad	100

Group Companies *(continued)*

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	%
Netherlands	
Smit Weld BV	54
New Zealand	
New Zealand Industrial Gases Ltd	62
Nigeria	
Industrial Gases Ltd	50
Norway	
Odda Smelteverk A/S	100
Pakistan	
Pakistan Oxygen Ltd	60
Papua New Guinea	
CIG New Guinea Pty Ltd (b)	100
Rhodesia	
Rhodesia Oxygen (Pvt) Ltd	100
Singapore	
Singapore Oxygen Pte Ltd	100
South Africa	
African Oxygen Ltd	66
Afrox Ltd (b)	100
Afrox Surgical & Hospital Equipment Ltd (b)	100
Dowson & Dobson Ltd (b)	100
Kwest Ltd (b)	100
Silicon Smelters (Pty) Ltd (b)	33
Vulcan Catering Equipment (Pty) Ltd (b)	100
Spain	
El Fresno SA	50

	%
Sri Lanka	
Ceylon Oxygen Ltd	100
Sweden	
Mediada AB	50
Viggo Intressenter AB	100
Tanzania	
Tanzania Oxygen Ltd (b)	100
Thailand	
Thai Industrial Gases Ltd (b)	70
Uganda	
Uganda Oxygen Ltd (b)	100
USA	
Edwards High Vacuum Inc	100
Fraser Sweatman Inc	100
Leland Industries Inc	100
SubOcean Services Inc	49
Zambia	
Zambia Oxygen Ltd	49

Notes

(a) In addition to the equity interest shown the Group also holds Preference Shares.

(b) Held through subsidiaries other than British Oxygen Investments Ltd and BOC Holdings Ltd.

(c) Interest disposed of 1st October 1973.

Comparison of Group results 1969-1973

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A 4836

	1969 £'000	1970 £'000	1971 £'000	1972 £'000	1973 £'000
Group sales and profits					
Sales	161 251	207 858	234 582	252 589	319 123
Group trading profit, including associated companies	22 345	26 905	30 449	33 530	42 269
Less development and research	2 639	2 589	2 424	2 631	3 380
Group profit before interest and tax	19 706	24 316	28 025	30 899	38 889
Less interest	4 236	5 431	7 894	8 440	10 511
Group profit before tax	15 470	18 885	20 131	22 459	28 378
Group profit after tax attributable to ordinary shareholders	6 266	8 326	8 971	10 233	11 287
Extraordinary profits/(*losses*) after tax	547	(*316*)	(*368*)	(*110*)	1 080
Capital employed					
Ordinary shareholders' capital and reserves	82 985	90 136	89 807	94 151	122 983
Preference stockholders' capital	2 500	2 500	2 500	2 500	2 500
Interests of minority shareholders	16 503	18 729	20 083	20 771	26 736
Deferred taxation	8 466	8 391	10 436	12 738	21 482
Regional development grants	—	—	—	—	97
Short and long term loans	48 595	52 411	76 096	75 322	90 346
Capital employed per balance sheet	159 049	172 167	198 922	205 482	264 144
Add Bank overdrafts and loans repayable within one year	23 200	29 497	22 927	31 642	34 639
	182 249	201 664	221 849	237 124	298 783
Return on average capital employed (based on profit before interest and tax)	11·7%	12·7%	13·2%	13·5%	14·5%
Ordinary dividend per 25p share	2·75p	3·00p	3·00p	3·00p	—
From 1969 to 1972 dividends are shown gross of income tax. From 1973 the dividends are payable under the imputation tax system	—	—	—	—	2·205p
Earnings per fully paid ordinary share (excluding extraordinary items)					
Under former tax system	3·30p	4·17p	4·46p	5·03p	—
Under imputation tax system	—	—	—	—	5·55p
	£'000	£'000	£'000	£'000	£'000
Issued ordinary share capital	47 479	49 929	50 282	50 879	50 879
Number of employees					
United Kingdom	18 600	19 400	19 600	20 000	20 300
Overseas	18 500	20 000	20 300	20 600	21 000

Sources and application of Group funds

A 4837

Ex-292-2-5

	1969 £'000	1970 £'000	1971 £'000	1972 £'000	1973 £'000
Sources of funds					
Retained profit (including minority interests)	2 216	3 005	3 545	5 866	9 248
Depreciation	11 696	14 034	14 636	15 214	18 319
Deferred tax	1 309	*(75)*	2 045	2 302	2 645
Internal cash flow	15 221	16 964	20 226	23 382	30 212
Loan capital	7 033	3 816	23 685	*(774)*	15 024
Bank overdrafts and loans repayable within one year	12 013	5 297	*(6 570)*	8 715	2 997
Increases in capital and share premium	5 166	4 486	541	1 515	—
Other	3 740	450	440	*(951)*	19
	43 173	31 013	38 322	31 887	48 252
Application of funds					
Expenditure on fixed assets (net)	23 247	26 325	28 643	23 908	25 145
Increase in working capital	16 075	4 285	5 385	3 183	16 548
Increase in investments	243	*(1 035)*	1 437	2 864	5 059
Goodwill arising on acquisitions	3 608	1 438	2 857	1 932	1 500
	43 173	31 013	38 322	31 887	48 252

Directors outside the UK

A 4838

cx-292-2-6

African Oxygen Limited	I Mackenzie CHAIRMAN J B Sutherland DEPUTY CHAIRMAN/GROUP MANAGING DIRECTOR	DIRECTORS C L F Borckenhagen W L Campbell-Pitt A J du Toit I S Haggie	I G Halliday W P Rousseau L E Smith A J J Wessels
Bangladesh Oxygen Limited	K Hartley CHAIRMAN M Anisuddowla MANAGING DIRECTOR	DIRECTORS N Almasood K D Moore	A Murtaza S Rahman
Canadian Oxygen Limited	J A Perham CHAIRMAN A R Dow PRESIDENT	DIRECTORS H A Agar J P Carrière Dr G J Côté R C Hesketh-Jones	J D Leitch L E Smith M Tanenbaum
Ceylon Oxygen Limited *Sri Lanka*	D E Martensz CHAIRMAN	DIRECTORS S Cumarasamy W S de Alwis	K D Moore
The Commonwealth Industrial Gases Limited *Australia*	K O Humphreys CHAIRMAN R R Law-Smith DEPUTY CHAIRMAN J A Davidson MANAGING DIRECTOR	DIRECTORS D K Allston R McR Grinlinton A S Grimwade R T Hardwick	Sir Richard Randall L E Smith W R D Stevenson A W Stewart
East African Oxygen Limited	I S Ednie CHAIRMAN M W Harley DEPUTY CHAIRMAN P J R Southgate MANAGING DIRECTOR	DIRECTORS R C Hesketh-Jones C H Malavu	D A Omari
Electric Arc (Jamaica) Limited	J A Perham CHAIRMAN G Wilby MANAGING DIRECTOR	DIRECTORS M O Austin T A Slattery	R W Stevens
Fraser Sweatman (Canada) Limited	J A Perham CHAIRMAN W C Moeller PRESIDENT	DIRECTOR M Benson	
Fraser Sweatman Inc *USA*	J A Perham CHAIRMAN W C Moeller PRESIDENT	DIRECTOR D Runyan	
Harris Lake Inc *USA*	J A Perham CHAIRMAN G Lake PRESIDENT	DIRECTOR W C Moeller	
Hong Kong Oxygen & Acetylene Company Limited	Sir Douglas Clague CHAIRMAN P Saint-Loup VICE CHAIRMAN R Beynon MANAGING DIRECTOR	DIRECTOR W H Henderson	
Indian Oxygen Limited	A K Sen CHAIRMAN K Hartley MANAGING DIRECTOR	DIRECTORS P C Basu S Chakravarty H Ghosh R C Hesketh-Jones D C Kothari	R H Mody A K Mukerji K Julian Scott L E Smith M A Sreenivasan
Industrial Gases Limited *Nigeria*	B W den Hartog } ALTERNATING CHAIRMEN K D Moore }	DIRECTORS A W Cobb	P J Kleiweg de Zwaan
Irish Industrial Gases Limited	D D Frame CHAIRMAN M J Garms MANAGING DIRECTOR	DIRECTORS S W Jack D W N Pitts	J M Williams K Wylie
A/S Kulsyre & Tørisfabriken 'Union' *Denmark*	R Bowdery CHAIRMAN	DIRECTORS H J Clausen P Federspiel	D W N Pitts G Thomsen

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Madef SA *Brazil*	A A Korting, W J Kuckartz } MANAGING DIRECTORS	DIRECTOR A A Tabbush	
Malayan Oxygen Sdn Berhad	C J Boyles CHAIRMAN AND MANAGING DIRECTOR	DIRECTORS D Arnott D F Barrington Baker D O bin Talib P G Grundy	R C Hesketh-Jones K D Moore D Nai-Wai Lee
Material Medico Quirurgico SA *Spain*	A K Cooper PRESIDENT R Luengo Tapia MANAGING DIRECTOR	DIRECTORS J P Prat y Torre G M Thomas	
Mediada AB *Sweden*	P Wahlin CHAIRMAN	DIRECTORS A K Cooper	S Boode
Medishield Inc *USA*	J A Perham CHAIRMAN W C Moeller PRESIDENT	DIRECTOR A I A Ray	
Medishield Products Limited *Canada*	J A Perham CHAIRMAN W C Moeller PRESIDENT	DIRECTORS J D Wordsworth	A R Dow
New Zealand Industrial Gases Limited	T G Hull CHAIRMAN R McR Grinlinton MANAGING DIRECTOR	DIRECTORS W F Airey W G Anderson D G E Brown	J A Davidson R C Macdonald L E Smith
Nissan Edwards Shinku KK *Japan*	N Ishizawa CHAIRMAN	DIRECTORS T Ito S Kawai H Nakagawa	T H C Raikes A I A Ray M W Unstead
Nordisk Kulsyrefabrik A/S *Denmark*	R Bowdery CHAIRMAN	DIRECTORS H J Clausen P Federspiel	D W N Pitts G Thomsen
Odda Smelteverk A/S *Norway*	P P Stabell CHAIRMAN O S Kristensen MANAGING DIRECTOR	DIRECTORS H Litsheim K Lunde A Rokne	D R Scarffe C Sommerfelt J M Williams
Pakistan Oxygen Limited	H I Rahimtoola CHAIRMAN M Nasim Khan MANAGING DIRECTOR	DIRECTORS L D B Bryceson J F C Gallaher R C Hesketh-Jones	S M Rafiq M A Raza
Priestley Insurance Company Limited *Bermuda*	C A B Leslie PRESIDENT C T M Collis VICE PRESIDENT	DIRECTORS J A Ellison R F Robertson	J M Williams
Rhodesia Oxygen (Pvt) Limited	G C V Coppen CHAIRMAN P B Thorne DIRECTOR/ GENERAL MANAGER	DIRECTORS D H Cummings J B Sutherland C H Targett	C J Voss W R Whaley
Singapore Oxygen Pte Limited	C J Boyles CHAIRMAN AND MANAGING DIRECTOR	DIRECTORS D Arnott D F Barrington Baker D O bin Talib P G Grundy	R C Hesketh-Jones K D Moore D Nai-Wai Lee
Smit Weld BV *Netherlands*	P Laister CHAIRMAN C F de Gooyer VICE CHAIRMAN	DIRECTORS F Blackmore P H Groenewald	J A Hermans Dr D Melvin
Viggo Intressenter AB *Sweden*	A K Cooper CHAIRMAN C B Raven MANAGING DIRECTOR	DIRECTOR R Magrell	
Zambia Oxygen Limited	A D Zulu CHAIRMAN D J Woodworth MANAGING DIRECTOR	DIRECTORS A W Cobb E A Kashita K D Moore	D C Mulaisho G Munkonge

A 4840

Medishield is the new organisation formed to co-ordinate the activities of more than 30 BOC companies engaged in international medical supplies. Its products and services include anaesthetic apparatus, disposable needles, orthopaedic implants, medical gases, hospital beds – even the equipping of complete new hospitals.

1 CIG (Australia) has developed a portable incubator for the safe transportation of sick and premature babies from outlying areas to major city hospitals.

2 Artificial implanted joints in chrome cobalt are made by Deloro Surgical at their UK factory and sold in more than 20 countries. The Deloro range includes joints for the hip, knee, ankle, wrist, elbow and shoulder.

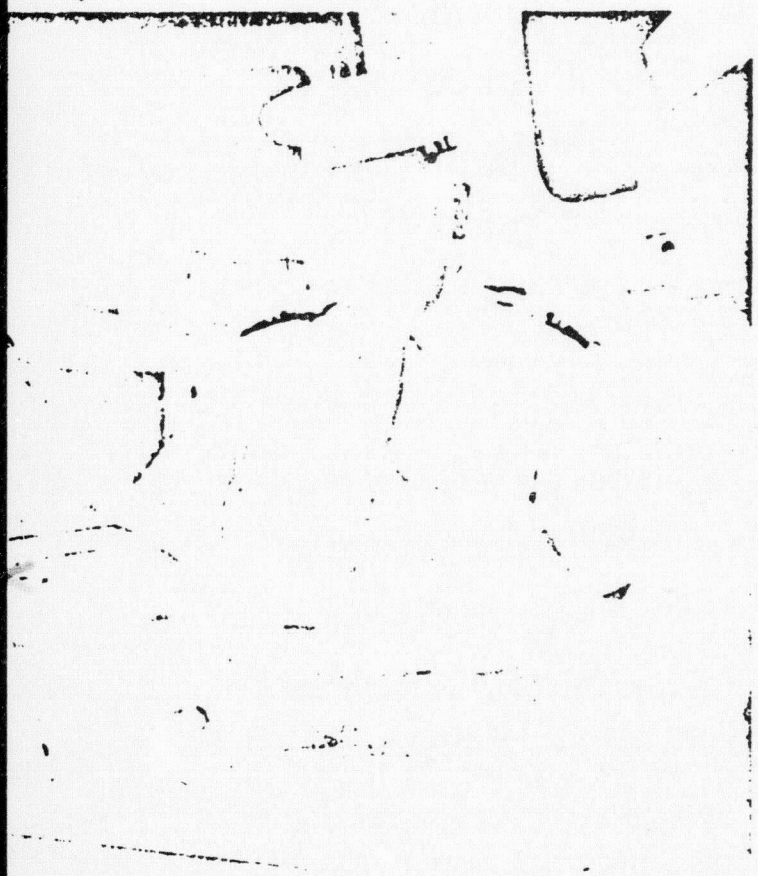
3 Ceiling mounted anaesthetic equipment produced by Medishield's Swedish joint venture company Mediada AB allows greater freedom of movement for operating theatre staff.

4 A Boyle anaesthetic apparatus is tested in the Ontario workshops of Medishield Products Limited, the Medishield organisation serving the Canadian market.

5 Relative Analgesia is a technique for relaxing a patient by removing fear and anxiety whilst not rendering him unconscious. It involves the use of low concentrations of nitrous oxide with high concentrations of oxygen and is increasingly used in dentistry. Medishield's Cyprane company makes the special equipment and exports 90% of its production.

6 A sophisticated lung ventilator for use in intensive care wards; also a wall-mounted trunking system which delivers power, communications and medical gas services direct to the bedhead. Both developed at Medishield's plant at Harlow, UK.

1

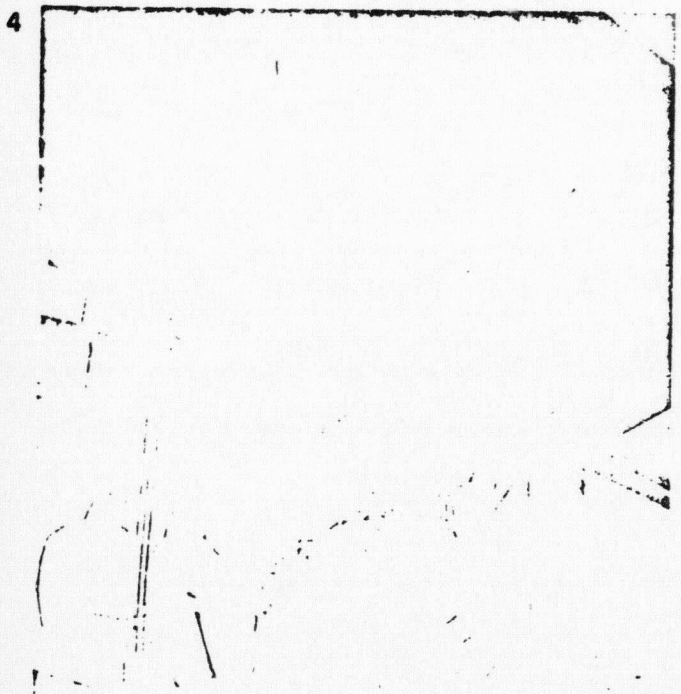


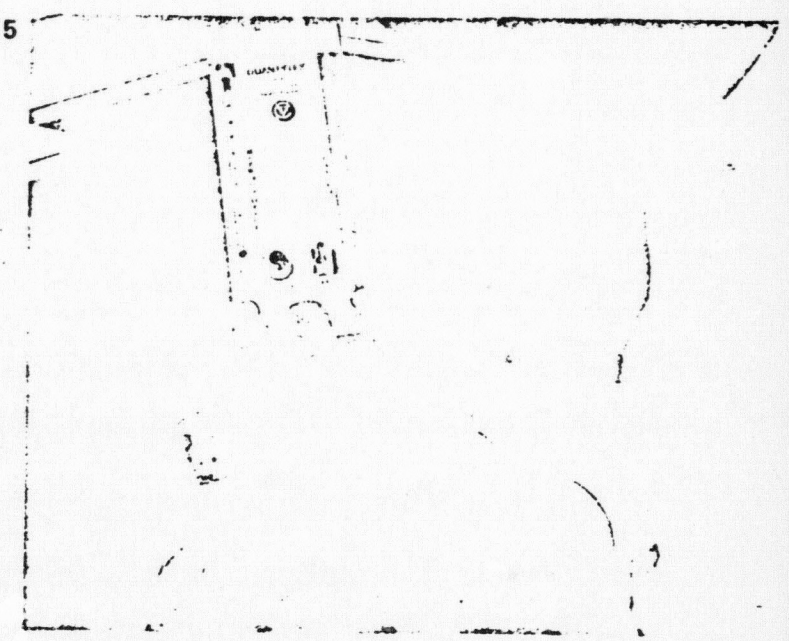
2

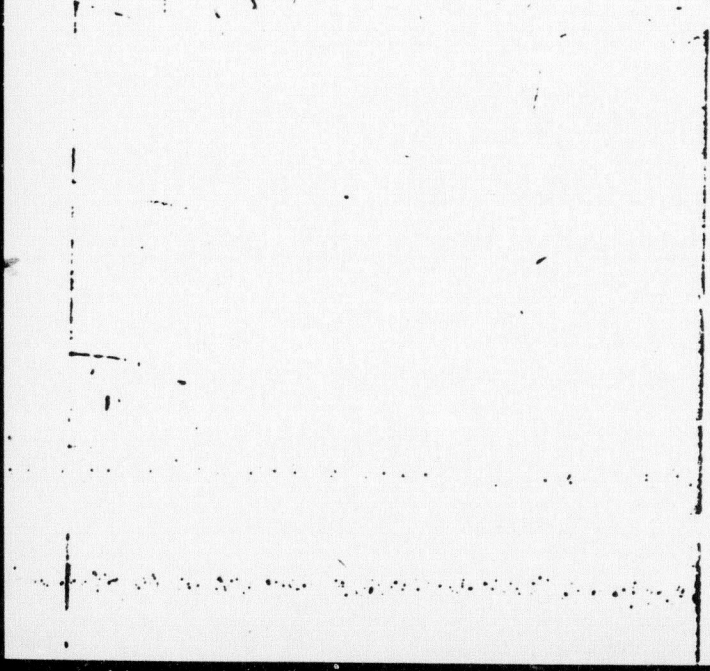
CX-292-2-8

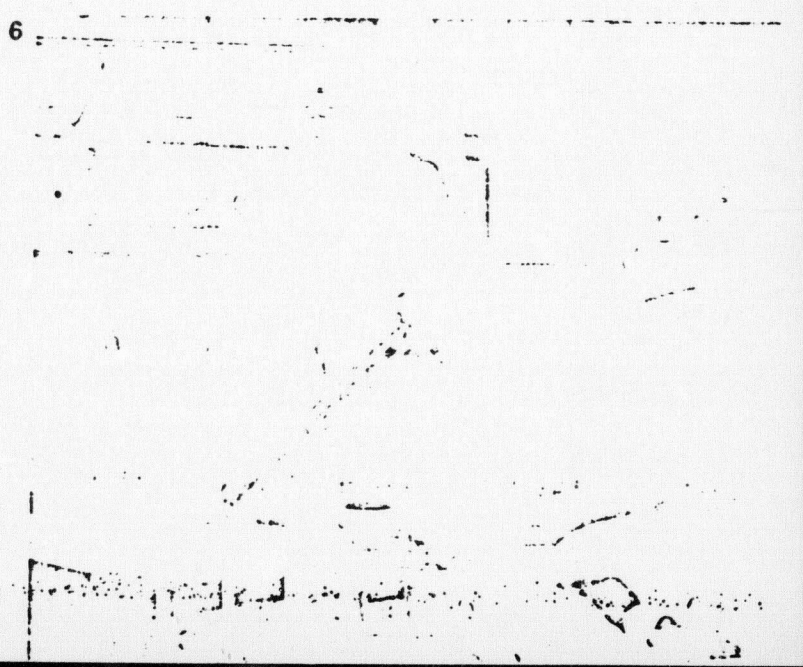
A 4841

CX-292-Z-9







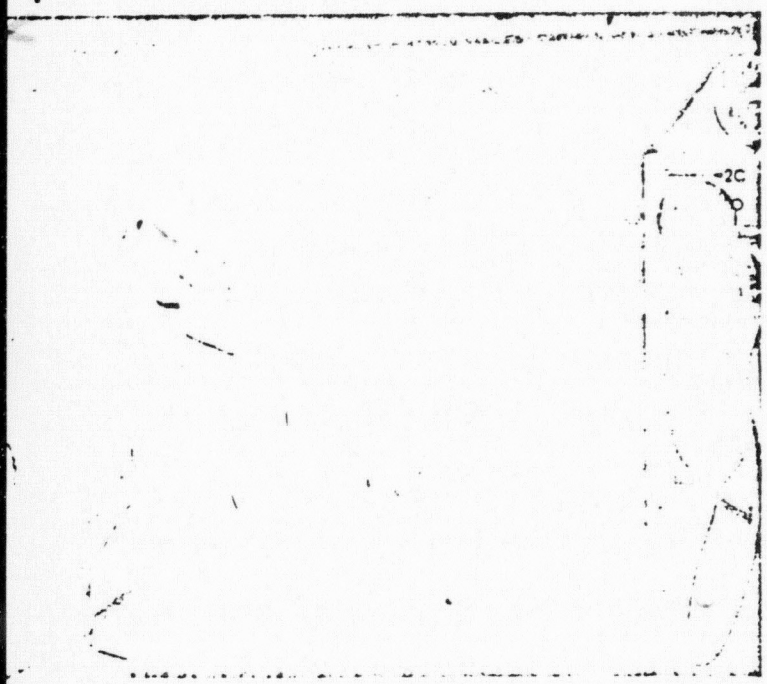


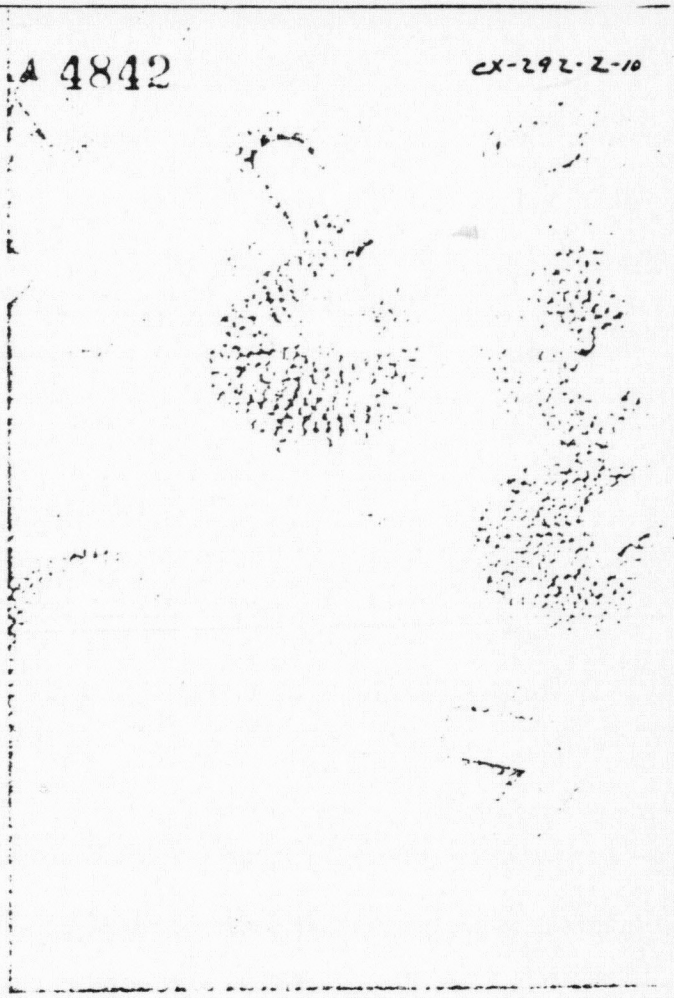
1 Assembling telephones at the Krugersdorp factory of Dowson & Dobson, a subsidiary of African Oxygen Ltd. The instruments are used in call-boxes throughout South Africa.

2 Several of the Group's companies supply liquid nitrogen for storing bull semen (at minus 196 C). This bank of semen stored in special 'straws' is typical of breeding centres in various parts of the world.

3 A BOC underwater welder at work. This is one of several businesses under development by BOC's New Venture Secretariat.

1





3

Shareholders' information

CX-292-2-11

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Dividend and interest payments

Ordinary Shares

Interim announced June, paid October
Final proposed December, paid March

Preference Stocks

Paid half yearly, 30 June and 31 December

By virtue of the Finance Act 1972, preference dividends payable after 5 April 1973 have been reduced to seven-tenths of their former gross rates. Thus:
the former 6½% Cum pref stock is now a 4.55% Cum pref stock,
the former 5% Cum 2nd pref stock is now a 3.5% Cum 2nd pref stock,
the former 4% Cum 2nd pref stock is now a 2.8% Cum 2nd pref stock.
For dividends payable before 31 March 1974 ie 30 June 1973 and 31 December 1973, there will be a related tax credit equal to three-sevenths of the new rates quoted above. Thereafter the related tax credit will depend upon the rate prescribed in any subsequent Finance Act.

Debenture and Loan Stocks

5¾% and 6¾% Debenture Stocks: paid half yearly, 15 May and 15 November,
8½% and 11% Tonnage Debenture Stocks: paid half yearly, 15 June and 15 December
7½% Unsecured Loan Stock: paid half yearly, 15 January and 15 July

Announcement of Group results

Three months' results, March
Half year's results, June
Nine months' results, September
Year's results, December
Report and Accounts, February

Capital Gains Tax

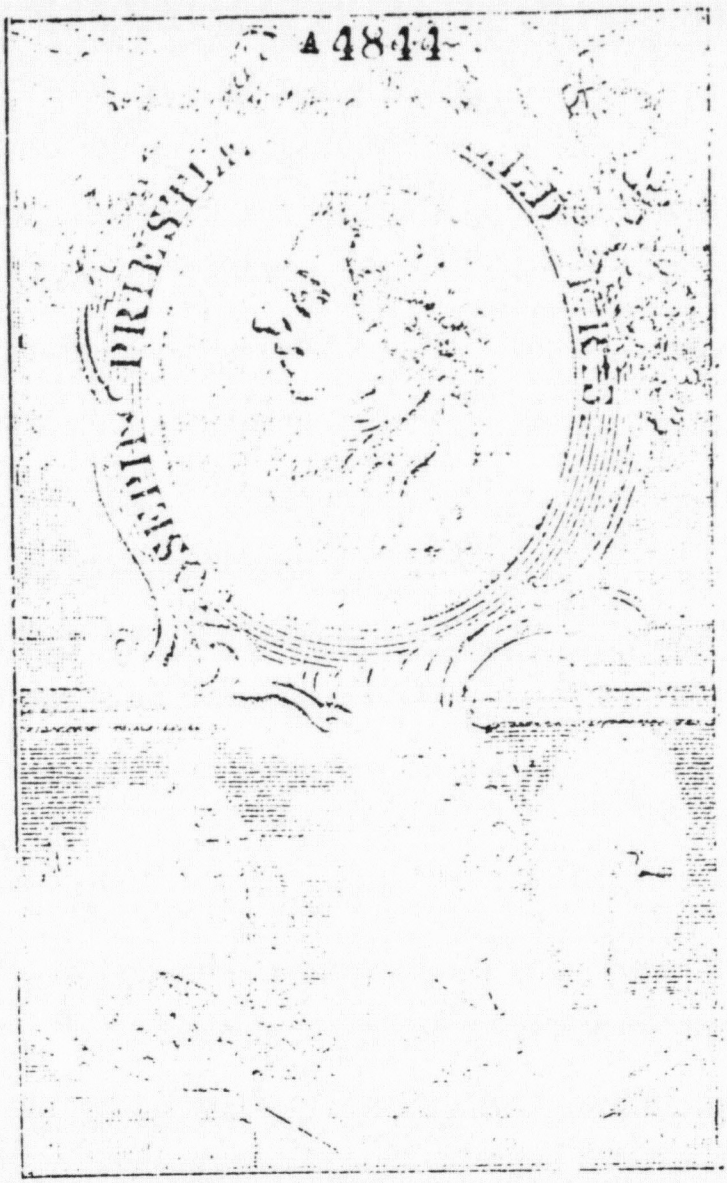
For capital gains tax purposes the market values of BOC ordinary shares, preference stocks and loan stocks at 6 April 1965 were:
Ordinary shares of 25p 45.3125p
4.55% Cum pref stock £1 units 68.75p
3.5% Cum 2nd pref stock £1 units 72.5p
2.8% Cum 2nd pref stock £1 units 56.25p
5¾% Debenture stock 1991/96 £87
6¾% Debenture stock 1985/90: fully paid £93½: £50 paid £51½

The Company is not a close company within the meaning of the Income and Corporation Taxes Act 1970, and there has been no change in that status since 30 September 1973.

Analysis of the holdings of ordinary shares of 25p each fully paid as at 30 September 1973

Size of holding 25p shares	Number of accounts	Per cent of total number of accounts	Number of 25p shares	Per cent of ordinary capital	Average holding 25p shares
1–500	32 126	43	8 039 761	4	250
501–1 000	15 931	22	11 970 260	6	751
1 001–5 000	23 184	31	48 425 218	24	2 088
5 001–50 000	2 629	4	28 854 713	14	10 975
50 001–1 000 000	306	—	56 309 774	28	184 000
Over 1 000 000	21	—	46 710 751	23	2 224 321
	74 197	100	203 470 477	100	

CX-292-2-12



Oxygen was discovered 200 years ago

During the summer of 1774 there took place the discovery of an event of world significance to every man, woman and child on earth. The discovery was made on 1 August 1774. The story of it is known in detail from records kept by the man who made the discovery,—Joseph Priestley (1733-1804), A theologian, teacher, student of politics and science, Priestley recorded his discovery for posterity in the notes he kept on the many experiments he carried out. Though he was not the person who gave the new element its name,

Before his researches only three gases had been clearly isolated and recognised: air, carbon dioxide and hydrogen. Priestley added no fewer than ten to the list, including sulphur dioxide and ammonia and was the first to show that oxygen is necessary for breathing and burning. He was also the inventor of what we now know as 'soda water'.

Priestley was to make more than 100 separate discoveries of [illegible], but [illegible] and [illegible] were [illegible] gases and was [illegible] world, and [illegible] not only [illegible] weight, but many of his principles have ever since been used in the teaching of elementary chemistry.

The scientific writer, J G Crowther [illegible] that [illegible] perhaps the greatest of [illegible].

To mark the bi-centenary of Priestley's discovery, BOC has commissioned Mr Crowther to write a [illegible] essay on Priestley, his work and his life. [illegible] write to G H Meadmore, BOC, Hammersmith [illegible].

A 4845

CX-243-A

THE BRITISH OXYGEN COMPANY LIMITED

ACQUISITION OF APPROXIMATELY 35 PER CENT OF THE COMMON STOCK

of

AIRCO, INC.

by

BOC Financial Corporation

Incorporated in the State of Delaware, U.S.A.

A Subsidiary of The British Oxygen Company Limited

A4846

DEFINITIONS

CX-293-B

In this document the following words and expressions shall have, unless otherwise stated, the following meanings:—

"BOC"	The British Oxygen Company Limited Registered in England, Number 22096
"B.O. Investments"	British Oxygen Investments Limited, a wholly-owned subsidiary of BOC Registered in England, Number 554021
"BOC Financial Corporation"	A wholly-owned subsidiary of BOC Incorporated in Delaware, U.S.A.
"Airco"	Airco, Inc. Incorporated in New York, U.S.A.
"FTC"	Federal Trade Commission of the United States.

References herein to "Dollars" or "$" are to United States Dollars.

Except as otherwise stated the rate at which Dollars have been converted into Pounds Sterling is $2·32 to £1·00, the rate of exchange ruling on 31st December, 1973.

A4847

THE BRITISH OXYGEN COMPANY LIMITED

CX-293-C

Directors:
L. E. Smith, *Chairman*
Sir Geoffrey Eley, C.B.E., *Vice-Chairman*
Sir John Cowley, G.C., K.B.E., C.B.
Lord Elworthy, G.C.B., C.B.E., D.S.O., M.V.O., D.F.C., A.F.C.
I. J. Fraser, C.B.E., M.C.
Sir Owen Wansbrough-Jones, K.B.E., C.B.
R. C. Hesketh-Jones, *Managing Director*
P. Laister, *Managing Director*
J. M. Williams, *Managing Director*

Registered Office:
Hammersmith House,
London, W6 9DX

14th March, 1974.

To the Ordinary Shareholders and, for information only, to the holders of all other listed securities of The British Oxygen Company Limited:

Dear Sir or Madam,

ACQUISITION OF INTEREST IN AIRCO

You have probably seen the announcement in the press of the successful tender offer made by BOC Financial Corporation, a United States subsidiary of BOC, for 4 million shares (approximately 35 per cent. of those outstanding) of the Common Stock of Airco, a United States corporation, at $20 per share. The purpose of this letter is to give you the details of the purchase and a description of the benefits which your Board believes will flow from it.

DETAILS OF THE PURCHASE

The negotiations

On Airco's initiative, discussions were started last July to examine whether the complementary nature of the two businesses offered sufficiently good commercial and industrial sense on which to base an association of the two companies to the advantage of shareholders and employees alike. The discussions between Airco and BOC were accelerated following the intervention of Curtiss-Wright Corporation of the United States. On 3rd December, Curtiss-Wright made a Tender Offer for up to 20 per cent. of the outstanding Common Stock of Airco at $18 a share. The original closing date of Curtiss-Wright's Tender Offer was 18th December. BOC's response, therefore, had to be swift. It culminated in a Tender Offer being made, with the support of the Airco Board, by BOC Financial Corporation for 4 million Airco shares at $20 per share. Curtiss-Wright withdrew its Tender Offer and tendered the shares it had purchased to BOC Financial Corporation. By 21st December, the closing date of BOC Financial Corporation's Tender Offer, approximately 6·2 million shares had been tendered, of which BOC Financial Corporation bought 4 million on a pro-rata basis.

Financing the purchase

The cost of buying 4 million shares of Airco was $80 million (£34·5 million) plus expenses estimated to amount to $2·8 million (£1·2 million). A United Kingdom subsidiary of BOC, B.O. Investments has borrowed the dollars required to finance the purchase and related expenses from a group of banks in London. These borrowings are unsecured and are repayable over approximately two years beginning in December, 1978. The interest rate is $\frac{3}{4}$ per cent. above the appropriate London Inter-Bank Rate for Eurodollars and will be fixed at one-, three-, six-, nine-, or twelve-monthly intervals at the option of the borrower. Interest for the first two months averaged $11\frac{11}{16}$ per cent. but has since been reduced to $9\frac{3}{8}$ per cent. for the three months commenced 24th February, 1974. Payment of interest and repayment of principal on these borrowings are guaranteed by BOC.

Airco Assets and Profits

Published financial and other information on Airco is contained in Appendix I. From this it will be seen that stockholders' equity as at 31st December, 1973 was $266 million (£114·7 million), equivalent to $23·49 (£10·12) per share.

The proportion of Airco's earnings attributable to the BOC shareholding in Airco will be included in BOC's consolidated profit and loss account. Assuming Airco earnings of $1·66 and dividends of $0·80 per share, as in 1973, and the current interest rate of $9\frac{3}{8}$ per cent. on the $80 million borrowed by B.O. Investments, the net benefit for the full year to the BOC consolidated profit and loss account would be £1·1 million. If the total dividends paid by Airco to BOC Financial Corporation were transferred to the United Kingdom certain additional United States and United Kingdom taxes would become payable to an estimated maximum of £450,000.

BENEFITS OF THE PURCHASE

BOC and Airco have a long history of co-operation and the managements of the two companies know each other well. The major markets of both companies are in similar broad general product fields (Industrial and Medical Gases, Welding Equipment and Consumables, and Medical Equipment) but are distinct in geography. Airco trades almost exclusively in the United States; until very recently BOC has traded almost exclusively in the United Kingdom and Commonwealth countries. The distinction is important. It means that if a full merger of the two companies is ever achieved, the benefits will not be dependent on rationalising production or other facilities which, with the accompanying large-scale employee redundancies, is frequently a distressing feature of such operations.

The Boards of both companies believe that each has much to offer the other. To Airco, the BOC Group offers an opportunity for marketing its technology and products through BOC companies across the world, to our mutual advantage. To BOC, Airco offers the following :—

Industrial and Medical Gases

(*a*) Success in the industrial and medical gas business—still much the largest single part of both BOC and Airco—does not rely on ability to export. It rests on an ability to identify an opportunity anywhere in the world and subsequently to exploit it locally by providing capital, technology and marketing experience. In developing economies, the commitment is usually small and easily accommodated. In fully developed industrial economies, if there is no existing foothold, the commitment is very demanding of financial and managerial resources, and the progress towards a satisfactory return is difficult and slow.

BOC derives much of its present strength from past decisions to establish operations in the Commonwealth countries and more than 50 per cent. of the BOC profit before tax now comes from outside the United Kingdom. Not only has a faster growth rate been made possible by this overseas investment but, in addition, greater security has been obtained by investing in the economies of many countries.

The association of Airco with BOC represents a striking reinforcement of this already successful policy. It establishes BOC firmly and immediately in the most powerful economy in the world in a way which would have been quite impossible to achieve by any other means.

(*b*) The unique features of the industrial gas business, which include advanced technology and heavy capital investment, and the great problems facing a new competitor where there is an established industry, have led inevitably to a situation in which markets throughout the non-communist world are dominated by a small number of large companies. Of these, BOC is the only British representative.

The competition between these companies is intense and, to an increasing extent, is being played out on a world stage rather than that of a single national or continental economy. Firm representation in the United States will give BOC enhanced competitive strength. Though size for the sake of size is no part of your Board's philosophy, the fact remains that, associated with Airco, BOC will be amongst the largest industrial and medical gas suppliers in the world. The significance lies in the added competitive power not in the added size.

Welding Equipment and Consumables

BOC manufactures and markets welding equipment and consumables in practically every country in which it operates. In addition, BOC exports to many other markets, with the notable exception of the United States. Airco has a strong position in the United States market, and exports widely, though rarely in direct competition with BOC.

Much of BOC's welding activity lies with the more mature, slow-growth products connected with long-established welding processes. Airco, operating in the more technologically innovative United States environment, has a stronger position than BOC in the newer high-growth semi-automatic processes, which are now progressively replacing older methods in many markets.

Medical Equipment

The third area of common interest between BOC and Airco is that of medical equipment. Both companies' interests originally centred around anaesthesia but are extending rapidly, with Airco having an additional strength in anaesthetic drugs. BOC, during the past two years, has been taking steps both by acquisition and rationalisation to strengthen its worldwide position in this important and high growth market but, to date, has no interests of significance in the United States.

Other trading

(*a*) BOC's Air Separation Unit plant building capacity is available to meet Airco's requirements.

(*b*) The remaining important areas of business lie (for BOC) in Metals, High Vacuum, Chemicals and Consumer Products and (for Airco) in Ferro Alloys, Graphite, Carbon Dioxide Equipment and Helium. Some additional market outlets for these products will be provided by the association of BOC with Airco but they will not be of major significance.

The price paid by BOC for these advantages had to be seen as fair from the point of view of both the Airco shareholder and the BOC shareholder. The over-subscription of the Tender Offer is a clear indication of the view of the Airco shareholder. For the BOC shareholder, it has already been noted that the price paid of $20 per share compares with a net asset value of $23·49 per Airco share and that, based on the 1973 Airco experience, the maximum earnings accruing to BOC would be equivalent to an additional 10 per cent. of the 1973 BOC Group profit attributable to the ordinary shareholder.

The Directors of Airco have nominated to their Board persons recommended by BOC in numbers proportionate to BOC's holding in Airco. They are initially the BOC Chairman, the Vice-Chairman and two Managing Directors. On BOC's part, we shall be welcoming Mr. G. S. Dillon, Chairman of the Board of Airco, and Mr. R. V. Giordano, President of Airco, to the BOC Board. As the major shareholder in Airco and with representation on its Board, BOC will have an influential voice in its management, subject to the Temporary Restraining Order referred to below.

FURTHER INFORMATION

For the future, BOC and Airco have agreed under the terms of a Memorandum Agreement dated 10th December, 1973, that, except with the prior approval of the Board of Directors of the other, neither company will make, authorise or permit any of its affiliates to make a tender, exchange or other offer for any securities of the other until 25th July, 1978. These limitations on BOC will terminate if a third party makes an offer for more than 15 per cent. of Airco. BOC has agreed to give Airco, or any person designated by Airco, first refusal of the shares of Airco held by BOC if BOC should wish to sell.

Meanwhile, the Office of Fair Trading in the United Kingdom has stated in a letter dated 3rd January, 1974 that the Secretary of State for Trade and Industry has no present intention of referring the acquisition to the Monopolies and Mergers Commission.

The Federal Trade Commission in the United States has obtained a Temporary Restraining Order against BOC and Airco designed to preserve the status quo pending further developments. The Order was issued on the grounds that the FTC has "reason to believe" that the United States Anti-Trust legislation "may" have been violated by BOC's purchase of Airco stock. In particular, the FTC is concerned that BOC's investment may eliminate BOC as a potential competitor in the American industrial gas market and as an actual competitor in a small segment of the American medical equipment market. BOC and their advisers are confident that the FTC objections can be refuted when the case is heard. The hearing is presently set for April, 1974.

Legal proceedings instituted by Curtiss-Wright against Airco, BOC, BOC Financial Corporation, and certain other subsidiaries of BOC, failed in their objective of stopping the BOC Financial Corporation Tender Offer and are in the process of being settled.

Appendix II contains General Information required by The Stock Exchange.

PROSPECTS AND CONCLUSION

Throughout the negotiations your Board has been advised by Lazard Frères & Co., and Paul, Weiss, Rifkind, Wharton & Garrison of New York; and by Lazard Brothers & Co., Limited, of London.

I am advised that as a result of the Temporary Restraining Order mentioned above no statement can be made by Airco to BOC regarding Airco's current trading position or future prospects, and no recent public statement has been made by Airco covering these matters.

As regards BOC, in the Annual Report and Accounts for the year to 30th September, 1973, I said:

> "The assumptions on which we had based our UK forward budgets are no longer valid and, as yet, we have no means of forecasting with any certainty the trading pattern for 1974." Even so "unless conditions should prove exceptionally bad on a worldwide scale, I expect any shortfall in UK earnings to be made up by increased earnings abroad."

To summarise for the immediate future: your Board expects the BOC Group to hold its own and that attributable Airco earnings will be more than sufficient to service the cost of acquiring the investment. It is with the longer term future, with all its potential, that we are mostly concerned.

From any point of view, the purchase of a substantial stake in Airco represents a major step by BOC made at a time of very difficult and uncertain economic and financial conditions. Had they not been convinced on two counts, your Board would not have embarked upon the transaction. The first related to the industrial and commercial benefits to be obtained ultimately from the investment and the second was that BOC was being presented with a unique opportunity to secure a major foothold in the USA market which, if lost, was unlikely ever to recur.

Nevertheless, it remains true that the hopes of both companies for the future will only be realised if we can learn to work together amicably, openly, and with the best interests of shareholders and employees kept constantly in mind. I am happy to report that, to date, in both companies and at all levels, these attitudes have been fully demonstrated.

Yours faithfully,

L. E. SMITH,

Chairman.

CX-293-G

APPENDIX I

Airco, Inc., and Subsidiaries

The information set out in paragraphs 1 to 9 below has been supplied by Airco. For convenience, sterling has been converted at $2·32=£1. In this Appendix, ton=2000 lbs.

1. Description of Airco's Business

Executive Offices.—85, Chestnut Ridge Road, Montvale, New Jersey, 07645, U.S.A.

Airco carries on its business principally through operating divisions in the United States. In addition, Airco manufactures and sells its products through two subsidiaries in Canada, one subsidiary in Mexico, and overseas subsidiaries in Belgium, France, the Federal Republic of Germany, the Netherlands, the United Kingdom, Singapore, Sweden and Switzerland, as well as through a joint venture in Japan. Airco's lines of business during 1973 were: industrial gases and cryogenic welding and cutting equipment, ferroalloys, carbon-graphite, electronics and metals, medical gases and equipment.

Airco's industrial gases are used primarily as follows: oxygen in the manufacture of steel and petrochemicals, in chemical processes, and in oxyacetylene processes; acetylene in oxyacetylene processes; Mapp gas (purchased from others) in cutting and metal-joining processes, nitrogen in various processes in the chemical, electronic, petroleum and aircraft industries, metal and food processing, food preservation, and in low temperature testing of missile components; argon as an inert atmosphere in metal processing and in inert gas-shielded electric arcwelding; hydrogen in the fabrication of electronic components in metal treating, in low temperature applications, and as a rocket propellent; helium (purchased from others) in inert gas-shielded electric arcwelding processes, in inerting of electronic and metal fabrication processes, in lifting applications, in carrier gas uses for instrumentation, and for extremely low temperature applications; rare gases for electronic tubes, tubular display lights, high intensity and incandescent light sources, and in physics experiments; specialty gases in the production of semi-conductors and in the calibration of equipment used by the chemical and pollution-control industries. Airco sells a broad line of cryogenic equipment for the processing, storage, handling and delivery of liquefied gases, and offers a wide range of oxyacetylene and other fuel gas cutting and welding apparatus machines and accessories: electric arcwelding apparatus, machines and accessories, welding positioners, turning rolls and manipulators, metal arc-welding electrodes, and a variety of arcwelding accessories and safety equipment.

Airco's ferroalloy products are concentrated in three principal alloy groups: chrome, silicon and manganese. In addition, Airco is a supplier of remelt stainless grindings. The most extensive use of chromium alloys and stainless remelt products is in stainless steels. Silicon alloys are used in the production of electrical steels which are utilised in many types of electrical apparatus.

Airco's principal carbon products include brushes for electric motors and generators that are widely used in the transportation and electrical appliance industries, welding and gouging rods for steel foundry and fabricating operations, carbon battery electrodes for use in the manufacture of dry cell batteries, and a broad variety of precision fixtures, moulds, and machined specialities for use in the metallurgical, electrical and electronic industries.

Airco's metals products include three principal groups: electron-beam hearth refined steels, ring components and forgings, and high-vacuum electron-beam production process equipment. In addition to general industrial forgings, Airco manufactures and sells seamless roll forged rings, press and hammer forgings, extrusions, crane mill parts, and custom rolled bars.

Airco produces and sells a wide range of anaesthetic, analgesic and therapeutic gases, including oxygen, nitrous oxide, cyclopropane and various medical gas mixtures. Principal markets for Airco's medical gases and equipment are hospitals, clinics and nursing homes, and the medical and dental professions.

Except for those facilities specifically referred to as being leased, all of Airco's plants are owned by it. Airco operates ten major oxygen plants at seven locations serving, by pipeline, adjacent plants of steel companies (capacities stated in tons per day): Bethlehem, Pennsylvania (650); Butler, Pennsylvania (120); Fairfield, Alabama (1,100); Johnstown, Pennsylvania (1,100); Buffalo, New York (500); Warren, Ohio (500); and Arroyo, West Virginia (1,300). Five of the above plants (Bethlehem, Butler, Buffalo, Warren and Arroyo) also produce liquid oxygen, nitrogen or argon, or combinations thereof for the merchant market.

Airco also operates three major plants for the supply of oxygen and/or nitrogen by pipeline to the chemical industry: Claymont, Delaware (375 oxygen, 400 nitrogen); Huron, Ohio (275 oxygen); East Alton, Illinois (700 oxygen, nitrogen); and Decatur, Alabama (280 oxygen, 600 nitrogen).

Eleven of Airco's oxygen and nitrogen plants serving the steel and chemical industries and described in the preceding paragraphs are leased to Airco by independent lessors. In each case Airco is obligated over a specified period (generally from ten to fifteen years, at the expiration of which Airco has the option to acquire the plant) to make payments sufficient to discharge and serve indebtedness incurred by the lessor to finance construction. A substantial portion of the gas producing capacity of each leased plant has been committed to major customers under long-term supply agreements which provided in the aggregate minimum revenues covering Airco's payments to the lessors of the plants. During 1973 Airco operated nineteen unattended gaseous nitrogen producing plants serving for the most part the electronics and chemical industries. In addition to the plants referred to, Airco operates six major air separation plants producing oxygen, nitrogen or argon or combinations thereof in liquid form, ranging in sales from 140 to 700 tons per day. The plants are at or near Alburn, Michigan; Los Angeles and San Francisco, California; South Acton, Massachusetts; Vancouver, Washington; and New Orleans, Louisiana.

Cryogenic equipment is produced at Airco-owned facilities in Irvine, California and also at leased facilities in Basle, Switzerland by Airco's wholly-owned Swiss subsidiary, Cryostar AG. Land has also been purchased in France on which a new manufacturing facility is under construction. Carbon dioxide is purified and liquefied at two Airco-owned plants (Lawrence, Kansas; and Hopewell, Virginia).

Welding and cutting equipment is manufactured at plant facilities in Union, New Jersey and metal arcwelding electrodes are manufactured in plants located at Sparrows Point, Maryland, and Cleveland, Ohio. A plant for the production of positioning equipment is located in Arcade, New York. Airco leases plant facilities in Chester, West Virginia for the production of metal arcwelding continuous wire electrodes (expiration date 1983, at which time Airco has the option to acquire the plant) and at Warren, Michigan, for the manufacture of arcwelding accessories and safety equipment (expiration date 1976). Airco's ferroalloy products are produced at plants located in Niagara Falls, New York; Calvert City, Kentucky; Mobile, Alabama; Charleston, South Carolina; and Vargon, Sweden. The aggregate furnace capacity of the foregoing ferroalloy plants is approximately 393,000 kilowatts. The plant facilities in Vargon, Sweden are owned by Airco's wholly-owned Swedish subsidiary, Airco Alloys AB. Carbon and graphite products are produced at plants in St. Marys and Punksutawney, Pennsylvania; Niagara Falls, New York; and Montreal, Quebec. The Montreal plant, which consists of a small finishing facility, is under lease to Airco's wholly-owned Canadian subsidiary, Speer Carbon Company of Canada Limited.

During 1973 electronic equipment was produced at plants located in Brandford, Pennsylvania (coils, fixed composition resistors and capacitors); Singapore; Nogales, Arizona; and Nogales, Mexico (coils). The Singapore plant, owned by Airco's wholly-owned subsidiary Airco Singapore Private Limited is located on leased property (lease expires in 1999). The Nogales, Mexico, plant is under lease to another wholly-owned subsidiary, Airco De Mexico, S.A., D.C.V.

Electron-beam hearth refined stainless and special steels are manufactured at plant facilities at Berkeley, California. Ring components and forgings are manufactured at two plants located in Albany, California and Verdi, Nevada. Nitrous oxide and cyclopropane are manufactured at plant facilities at Cleveland, Ohio. Nitrous oxide is also manufactured at facilities in Toronto, Canada and Berkeley, California. Medical equipment is manufactured principally at a plant and office facility in Madison, Wisconsin. Additional manufacturing facilities are located at Ft. Myers, Florida; and Richmond, California.

2. Directors and Officers at 31st December, 1973

Directors

•GEORGE S. DILLON
Chairman of the Board and Chief Executive Officer

•RICHARD V. GIORDANO
President and Chief Operating Officer

CHARLES S. MUNSON
Honorary Chairman of the Board

†ALBERT FAULCONER, JR.

†RICHARD G. FOLSOM

JOSEPH H. HUMBERSTONE
Group Vice President

•†R. L. IRELAND, III

ROBERT H. LEGG

ROBERT E. McNAIR

•CROCKER NEVIN

†JOHN S. SHAW, JR.

DOUGLAS B. STEIMLE

•Executive Committee—1973.
†Audit Committee—1973.

Officers

GEORGE S. DILLON
Chairman of the Board and Chief Executive Officer

RICHARD V. GIORDANO
President and Chief Operating Officer

JOSEPH H. HUMBERSTONE
Group Vice President

NORRIS B. McFARLANE
Group Vice President

DAVID J. CRAIG
Group Vice President

DAVID H. LYALL
Vice President

DOUGLAS M. MORE
Vice President—Law

DONALD REICH
Vice President—Finance

DONALD B. BUSSEWITZ
Controller

WALTER J. NABER, JR.
Treasurer

JOSEPH M. WALSH, JR
Secretary

3. Extracts from the Audited Consolidated Balance Sheet—31st December, 1973

ASSETS

	$000's	£000's
CURRENT ASSETS		
Cash and Short-Term Securities, at cost	15,838	6,827
Notes and Accounts Receivable (less allowances for doubtful accounts —$1,570,000; £677,000)	101,668	43,822
Inventories	127,431	54,927
Prepaid Expenses	4,799	2,069
Total Current Assets	249,736	107,645
PROPERTY, PLANT AND EQUIPMENT (at cost)		
Land	8,555	3,687
Buildings and Leasehold Improvements	115,661	49,854
Machinery and Equipment	390,103	168,148
Construction in Progress	11,846	5,106
Contract Rights to Production and Distribution	5,250	2,263
Total	531,415	229,058
Less Accumulated Allowances for Depreciation, Amortization and Obsolescence	219,552	94,634
Property, Plant and Equipment—Net	311,863	134,424
INVESTMENTS (principally at equity)	2,668	1,150
LONG-TERM RECEIVABLES (less unamortized discount based on imputed interest rate of 9½%—$1,703,000 (£734,000))	13,372	5,764
DEFERRED CHARGES	6,582	2,837
GOODWILL, PATENTS AND TRADEMARKS (net of amortization)	6,010	2,590
TOTAL	$590,231	£254,410

LIABILITIES AND STOCKHOLDERS' EQUITY

CURRENT LIABILITIES		
Accounts Payable	38,882	16,759
Bank Loans and Currently Maturing Long-Term Debt	10,984	4,734
Accruals	25,007	10,779
Federal and Foreign Taxes on Income	835	360
Total Current Liabilities	75,708	32,632
LONG-TERM DEBT		
Industrial Revenue Bonds, 5¾%, due 1984-93	6,600	2,845
Convertible Subordinated Debentures, 3¾%, due 1977-87	31,762	13,691
Sinking Fund Debentures, 6½%, due 1987	2,259	974
Domestic Bank Notes, 10% Currently, due 1976-79	45,000	19,397
Foreign Bank Notes, 6½-12% Currently, due 1975-88	13,074	5,635
Promissory Notes, 4·85-7¾% Currently, due 1975-88	62,480	26,931
Other Debt (principally mortgages)	5,955	2,567
Total Long-Term Debt	167,130	72,040
OTHER LIABILITIES AND DEFERRED CREDITS		
Deferred Income Taxes	74,476	32,102
Miscellaneous	6,840	2,948
Total Other Liabilities and Deferred Credits	81,316	35,050
STOCKHOLDERS' EQUITY	266,077	114,688
TOTAL	$590,231	£254,410

4. Extracts from the Audited Statement of Consolidated Income—For the year ended 31st December, 1973

	$000's	£000's
Net Sales	583,811	251,643
Other Income—Net	1,022	440
Total	584,833	252,083
Deductions		
Cost of Goods Sold	467,184	201,372
Selling, Administrative and Other Expenses	75,450	32,522
Interest Expense	12,839	5,534
Federal and Foreign Taxes on Income	10,249	4,418
Total	565,722	243,846
Net Income	19,111	8,237
Dividends Paid ($0·80 (34·5p) per Common Share)	9,227	3,977
Retentions	$9,884	£4,260
Earnings Per Share of Common Stock	$1·66	71·6p
Fully Diluted Earnings Per Share	$1·56	67·2p

5. Extracts from the Notes to the Accounts

(*a*) *Property, Plant and Equipment.* Capital expenditures during 1973 aggregated $28,800,000 (£12,414,000). Depreciation and amortization amounted to $27,530,000 (£11,866,000).

(*b*) *Short-Term Borrowings.* The company had available at various domestic banks and/or their foreign branches, lines of credit aggregating $47,000,000 (£20,259,000) at 31st December, 1973. The average daily loan outstanding for the year was $18,790,000 (£8,099,000) at an average rate of 8·05 per cent. The maximum debt outstanding at any one time during the year was $27,500,000 (£11,853,000). Compensating balance requirements for the domestic lines are the same as those for the agreement explained under the caption "Long-Term Debt", except there are no balance requirements against the Eurodollar portion. No fees are incurred on unused portions of credit lines, and accordingly such lines can be withdrawn at the option of the various banks. There was no related bank debt outstanding against the lines at 31st December, 1973.

(*c*) *Long-term Debt.* Following are the amounts payable annually during the five year period ending 31st December, 1978. Included in the 1977 and 1978 amounts payable are sinking fund deposits on the 3¾ per cent. convertible subordinated debentures:

1974	$ 5,836,000 (£ 2,516,000)
1975	$ 5,977,000 (£ 2,576,000)
1976	$27,717,000 (£11,947,000)
1977	$18,941,000 (£ 8,164,000)
1978	$18,944,000 (£ 8,166,000)

Subject to certain limitations and payments of premiums, prepayments on all long-term debt may be made. Of the total long-term debt of $167,130,000 (£72,039,000) at 31st December, 1973, $4,356,000 (£1,878,000) was repayable in foreign currency.

Under a 1972 agreement, domestic banks are committed to lend $50,000,000 (£21,552,000) to Airco through 31st July, 1975, of which $45,000,000 (£19,397,000) had been borrowed and was outstanding at 31st December, 1973. Repayment of these notes is required to be made in equal semi-annual instalments over a four-year period beginning on 31st January, 1976. The notes bore interest at the best rate established, from time to time, by The Chase Manhattan Bank (National Association), one of the participating banks, until 31st July, 1973 at which time the interest rate was increased to ¼ per cent. above that rate until 31st July, 1975, and ½ per cent. above that rate, thereafter.

In connection with this agreement, Airco, under oral, informal arrangements, which do not restrict the withdrawal or use of funds, is expected to maintain and has substantially maintained an average compensating balance of 20 per cent. of the average bank loans outstanding for the year ended 31st December, 1973. Such depository amounts are determined from the bank's ledger records adjusted for estimated uncollected funds. Compensating balances maintained under these arrangements were approximately $11,500,000 (£4,957,000) at 31st December, 1973. The corresponding balance on the company's books was approximately $6,000,000 (£2,586,000).

The instruments relating to long-term debt contain provisions which limit the amount that may be expended for the payments of cash dividends and the purchase, redemption, or retirement of Airco's capital stock. As of 31st December, 1973, under the most restrictive of these provisions, the amount available for such purposes was approximately $32,800,000 (£14,138,000).

(*d*) *Capital Stock.* Capital stock at 31st December, 1973, consisted of:

	Shares	
	Authorised	*Outstanding*
Preferred stock, $5 par value	1,000,000	—
Common Stock, $1 par value, net of shares held in treasury of 444,009	20,000,000	11,324,730
Common stock reserved for issuance at 31st December, 1973, consisted of:		
Conversion of debentures at $31·25 a share through 1987		1,016,384
Stock option and stock purchase plans		378,961

In 1973 Airco purchased 610,700 shares of its common stock; 390,000 for issuance to employees under the employee stock purchase plan and 220,700 for use in acquisitions or other general corporate purposes. The balance of shares still held in treasury at 31st December, 1973 consisted of 236,199 shares reserved for issuance to employees under the employee stock purchase plan and 207,809 shares intended for use in acquisitions or other general corporate purposes.

(*e*) *Stock option and stock purchase plans.* Under Airco's stock option plans, shares of common stock have been made available to certain key employees at the fair market value at the date the options were granted.

A summary of option data for 1973 is shown below:

	Number of Shares Under Option	*Aggregate Option Price*	
Outstanding, 1st January	120,000	$2,808,000	£1,210,000
Granted	60,000	$832,000	£359,000
Exercised	—	—	—
Terminated	(42,800)	($1,242,000)	(£535,000)
Outstanding 31st December	137,200	$2,398,000	£1,034,000
Exercisable	39,800	$781,850	£337,000
Available for grant	12,562		

The employee stock purchase plan entitles eligible employees to purchase unissued common stock or shares held in treasury at 85 per cent. of the closing market price of the common stock at certain quarterly dates. Through 31st December, 1973 an aggregate of 570,801 shares (for consideration of $8,483,000 (£3,656,000)) have been purchased.

(*f*) *Federal and Foreign Taxes on Income.* Federal and foreign taxes on income in 1973 consisted of:

Current income taxes	$5,830,000	£2,513,000
Deferred income taxes	$6,489,000	£2,797,000
Investment tax credits	($2,070,000)	(£892,000)
	$10,249,000	£4,418,000

Deferred income taxes arise due to timing differences between reported and taxable income relating to accelerated methods of depreciation, allowances for estimated losses on facility abandonments, certain deferred charges and taxes on the unremitted earnings of certain foreign subsidiaries and affiliates.

Total Federal and foreign taxes on income were less than would have resulted from application of the normal United States Federal tax rate for the following reasons:

Normal United States Federal tax rate	48·0%
Increase (Reduction) in taxes resulting from:	
Investment tax credit	(7·1)
Taxes not provided on unremitted earnings of foreign subsidiaries	(5·0)
Other	(1·0)
Actual effective tax rate	34·9%

Taxes have not been provided on unremitted earnings of certain foreign subsidiaries whose earnings are to be reinvested in plant expansion, working capital and payment of foreign long-term debt. The total of such foreign earnings included in consolidated retained earnings is not material.

(*g*) *Earnings per share of Common Stock.* Earnings per share of common stock are based on the weighted average number of shares of common stock outstanding during the respective years. Dilution from common stock equivalents (certain shares issuable under stock option plans) is not significant.

Fully diluted earnings per share recognizes the potential exercise or purchase of common stock equivalents, and the assumed conversion of the 3⅞ per cent. subordinated debentures. For the purpose of this calculation, net income is adjusted to reflect elimination of interest and issue expense, net of income taxes, relating to the assumed conversion of the debentures.

(*h*) *Retirement Plans.* Airco and its subsidiaries maintain retirement plans covering substantially all officers and employees. The total pension expense for the year ended 31st December, 1973 was approximately $3,983,000 (£1,717,000). As to some of the retirement plans, fund assets were approximately $11,700,000 (£5,043,000) in excess of the actuarially computed value of vested benefits as of the most recent valuation dates and, as to the other plans, fund assets were approximately $4,100,000 (£1,767,000) less than the actuarially computed value of vested benefits at such dates.

(*i*) *Commitments.* The unexpended portion of amounts authorized for capital expenditures at 31st December, 1973 approximated $28,380,000 (£12,233,000) as to which commitments have been made for approximately $11,397,000 (£4,912,000).

Commitments: continued:

Rental expense and minimum rental commitments under non-cancelable leases are summarized below:

	Total		Noncapitalized Financing Leases	
	$000's	£000's	$000's	£000's
Rental Expense				
1973	17,353	7,480	11,975	5,162
Minimum rental commitments under non-cancelable leases:				
1974	15,300	6,595	14,200	6,121
1975	13,400	5,776	12,700	5,474
1976	12,000	5,172	11,400	4,914
1977	10,600	4,569	10,100	4,353
1978	8,800	3,793	8,500	3,664
1979-83	34,400	14,828	32,900	14,181
1984-88	9,800	4,224	8,800	3,793
1989-93	7,700	3,319	7,700	3,319
Total	$112,000	£48,276	$106,300	£45,819

Of the $112,000,000 (£48,276,000), $5,700,000 (£2,457,000) pertained to warehouse and office rentals and $106,300,000 (£45,819,000) to plant and equipment.

The present values of the minimum rental commitments for all noncapitalized financing leases approximated $74,900,000 (£32,284,000) at 31st December, 1973. Of this amount $60,400,000 (£26,034,000) pertained to production facilities and $14,500,000 (£6,250,000) to distribution and other equipment. Of the amounts pertaining to production facilities, approximately 93 per cent. pertain to tonnage gas plants, which supply customers under long-term sales contracts providing for aggregate minimum revenues which more than cover the aggregate rentals under such leases. Interest rates ranging from 4·3 per cent. to 14 per cent. for 1973 were used to calculate the present values.

If, in accordance with a Securities and Exchange Commission regulation adopted in 1973, noncapitalized financing leases were capitalized, related assets amortized on a straight-line basis and interest cost accrued on the basis of the outstanding lease liability, the impact in 1973 on Airco's net income would have been less than three per cent. of the average net income for the most recent three years.

6. Statement of Accounting Policies—The accounting policies followed by Airco in maintaining financial records and preparing financial statements are set forth below:

(*a*) *Principles of Consolidation.* The financial statements include the accounts of all domestic and foreign subsidiaries of Airco and the equity in the underlying net assets of significant affiliated companies when Airco's ownership is in excess of 20 per cent.

(*b*) *Inventory Pricing.* Inventories are valued at the lower of average cost or market.

(*c*) *Depreciation Methods.* Allowances for depreciation and amortization are accumulated generally on a straight-line basis. Alloys production equipment acquired after 1st January, 1971 and electron-beam production facilities are depreciated on the units of production method.

(*d*) *Goodwill, Patents and Trademarks.* Goodwill is amortized on the straight-line basis over a period of 40 years. Patents and trademarks are valued at $1 (43p) for financial statement purposes; related costs are charged to operations in the year incurred.

(*e*) *Income Taxes.* Income taxes are provided in the year transactions enter into the determination of net income regardless of when such transactions are recognised for tax purposes. Accordingly, income taxes affecting payments in future years are included in deferred income taxes. Investment tax credits are included as reductions of income tax expense in the year the credits arise.

(*f*) *Research and Development Costs.* Expenditures for research and development are charged to operations in the year incurred.

(*g*) *Translation of Foreign Currencies.* Current assets and current liabilities are translated into U.S. dollars at the exchange rate in effect at the reporting dates. Long-term assets and liabilities and stockholders' equity are translated at the rates of exchange in effect when acquired, incurred or issued. Revenues, costs and expenses for each month are translated at the exchange rate in effect at the end of the month, except for depreciation and amortization which are translated at the rates of exchange in effect when the respective assets were acquired. Net unrealized gains from foreign currency translation are deferred. Net unrealized losses from foreign currency translation would be charged to income to the extent that they exceed gains previously deferred. All other exchange adjustments are charged or credited to income.

7. Five Year Financial Summary

(a) Figures in $000's except for per share data.

	1973	1972	1971†	1970	1969†
Sales and Earnings					
Net sales*	$583,811	492,295	411,409	405,634	403,537
Interest expense	$12,839	9,676	10,707	11,556	10,232
Income before taxes*	$29,360	27,200	31,661	29,648	29,557
Income from continuing operations	$19,111	17,944	18,248	17,105	18,590
Income (loss) from discontinued operations	—	77	815	(111)	1,736
Income before extraordinary items	$19,111	18,021	19,063	16,994	20,326
Extraordinary items	—	(16,000)	—	(10,500)	—
Net income	$19,111	2,021	19,063	6,494	20,326
Average number of common shares outstanding	11,536	11,754	11,645	11,432	11,303
Earnings per share of common stock from continuing operations*	$1·66	1·53	1·57	1·50	1·65
Dividends Paid					
Dividends per common share	$·80	·80	·80	·80	1·15
Dividends on common stock	$9,227	9,396	9,286	9,163	12,863
Stockholders' Equity					
Amount	$266,077	262,439	268,235	255,747	256,222
Common stock outstanding—shares	11,325	11,765	11,668	11,504	11,348
Per share	$23·49	22·31	22·99	22·23	22·58

(b) Figures in £000's except for per share data.

	1973	1972	1971†	1970	1969†
Sales and Earnings					
Net sales*	£251,643	212,196	177,331	174,842	173,938
Interest expense	£5,534	4,171	4,615	4,981	4,410
Income before taxes*	£12,655	11,724	13,647	12,779	12,740
Income from continuing operations	£8,237	7,734	7,866	7,373	8,013
Income (loss) from discontinued operations	—	33	351	(48)	748
Income before extraordinary items	£8,237	7,768	8,217	7,325	8,761
Extraordinary items	—	(6,897)	—	(4,526)	—
Net income	£8,237	871	8,217	2,799	8,761
Average number of common shares outstanding	11,536	11,754	11,645	11,432	11,303
Earnings per share of common stock from continuing operations*	71·6p	65·9p	67·7p	64·7p	71·1p
Dividends Paid					
Dividends per common share	34·5p	34·5p	34·5p	34·5p	49·6p
Dividends on common stock	£3,977	4,050	4,003	3,950	5,544
Stockholders' Equity					
Amount	£114,688	113,120	115,619	110,236	110,441
Common stock outstanding—shares	11,325	11,765	11,668	11,504	11,348
Per share	£10·12	£9·62	£9·91	£9·58	£9·73

*Continuing operations. Earnings per share of common stock are before discontinued operations and extraordinary items.

†Financial and operating results of companies acquired in poolings of interests in 1971, and 1969 are included from periods of acquisition. Other years have not been restated since, in the aggregate, operations of these companies for all periods are not material in relation to the consolidated sales and operations of Airco.

8. Sales and Earnings by Product Line — Airco, Inc., and Subsidiaries for the years ended 31st December, 1973 and 1972

(Millions of Dollars)

	Sales 1973		*Sales* 1972		*Earnings*(1) 1973		*Earnings*(1) 1972	
	$	%	$	%	$	%	$	%
Industrial Gases; Cryogenic, Welding and Cutting Equipment	262·1	44·9	240·0	48·7	27·1	52·7	26·8	60·8
Ferroalloys	162·6	27·9	128·3	26·1	5·9	11·5	3·9	8·8
Carbon, Graphite, Electronics and Metals	105·9	18·1	81·3	16·5	10·7	20·8	7·2	16·3
Medical Gases and Equipment	53·2	9·1	42·7	8·7	7·7	15·0	6·2	14·1
Total	$583·8	100·0	$492·3	100·0	$51·4	100·0	$44·1	100·0

(Millions of Pounds)

	Sales 1973		*Sales* 1972		*Earnings*(1) 1973		*Earnings*(1) 1972	
	£	%	£	%	£	%	£	%
Industrial Gases; Cryogenic, Welding and Cutting Equipment	113·0	44·9	103·4	48·7	11·7	52·7	11·6	60·8
Ferroalloys	70·1	27·9	55·3	26·1	2·5	11·5	1·7	8·8
Carbon, Graphite, Electronics and Metals	45·6	18·1	35·1	16·5	4·6	20·8	3·1	16·3
Medical Gases and Equipment	22·9	9·1	18·4	8·7	3·3	15·0	2·6	14·1
Total	£251·6	100·0	£212·2	100·0	£22·1	100·0	£19·0	100·0

(1) Before income taxes, interest and corporate expense.

9. Sales and Net Income by Quarter (based on continuing operations)

	Sales (Millions of Dollars)			*Net Income per Share*		
	1973	1972	1971	1973	1972	1971
1st Quarter	129·5	119·5	105·0	0·31	0·50	0·46
2nd Quarter	143·1	127·0	105·6	0·43	0·50	0·43
3rd Quarter	142·9	110·7	95·2	0·42	0·29	0·24
4th Quarter	168·3	135·1	105·6	0·50	0·24	0·44
	$583·8	$492·3	$411·4	$1·66	$1·53	$1·57

	Sales (Millions of Pounds)			*Net Income per Share*		
	1973	1972	1971	1973	1972	1971
1st Quarter	55·8	51·5	45·3	13·4	21·6	19·8
2nd Quarter	61·7	54·8	45·5	18·5	21·6	18·5
3rd Quarter	61·6	47·7	41·0	18·1	12·4	10·4
4th Quarter	72·5	58·2	45·5	21·6	10·3	19·0
	£251·6	£212·2	£177·3	71·6p	65·9p	67·7p

10. Share Price Information

(a) Yearly Highs and Lows of Airco Common Stock, as published by Moody's Investors Service, Inc.

	1974 (to 5th March)	1973	1972	1971	1970
High	$14⅞	18¼	23⅜	26½	23⅜
Low	$12½	10¾	16½	16¼	12½

(b) High, Low and Closing Prices of Airco Common Stock as at the following dates:

	High on day	*Low on day*	*Closing*
As at 28th September, 1973	$12⅜	12½	12½
31st October	$13⅜	12¾	12¾
30th November	$13⅜	12⅞	12⅞
31st December	$13⅞	13¼	13¼
31st January, 1974	$13⅜	13⅜	13⅜
28th February	$13½	13	13
5th March	$13¼	12⅞	13¼

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APPENDIX II

CX-293-Q

General Information

1. The Directors of BOC have taken all reasonable care to ensure that the facts stated and opinions expressed in this document in so far as they relate to BOC and its subsidiaries are fair and accurate and that no material factors or considerations have been omitted and they jointly and severally accept responsibility accordingly.

2. The Directors are of the opinion that BOC and its subsidiaries, taking into consideration the transactions described in this Circular, will have adequate working capital for their present requirements, having regard to the bank facilities available.

3. The interests of the Directors of BOC and their families in the share capital of BOC and its subsidiaries appearing in the register maintained under the provisions of the Companies Act 1967 are as follows:

Beneficial	
Mr. L. E. Smith	1,000
	*55,000
Sir Geoffrey Eley	15,595
Sir John Cowley	3,200
Lord Elworthy	2,000
Mr. I. J. Fraser	5,000
Sir Owen Wansbrough-Jones	5,280
Mr. P. Laister	1,000
	*45,000
Mr. J. M. Williams	2,000
	*45,000
Mr. R. C. Hesketh-Jones	4,042
	*45,000
As trustee	
Sir Geoffrey Eley	19,080
Mr. R. C. Hesketh-Jones	1,800

NOTES

(a) All are ordinary shares and are fully paid unless marked with an * which are 5 per cent. paid.

(b) No Director has a beneficial interest in any debentures or preference shares of BOC or in any shares or debentures of any subsidiary company.

4. Except as described herein neither BOC, nor any of its subsidiaries, nor any of its Directors, holds any securities of Airco.

5. Except as described herein since 30th September, 1973 being the date to which the last published audited accounts of BOC were made up:

(a) no share or loan capital of BOC or any of its subsidiaries has been issued for cash, or otherwise than for cash, or is proposed to be so issued other than the issue of 2,000,000 shares of Rands 0·50 by African Oxygen Limited;

(b) no commissions, discounts, brokerages or other special terms have been granted in connection with the issue or sale of any share or loan capital of BOC or any of its subsidiaries.

6. No capital of BOC or any of its subsidiaries is under option or agreed conditionally or unconditionally to be put under option except that BOC may be required to acquire the above-mentioned 2,000,000 Rands 0·50 shares of African Oxygen Limited issued by that company in connection with a proposed investment in the Republic of South Africa.

7. The Directors are not aware of any shareholding of 10 per cent. or more in the capital of BOC.

8. The total emoluments of the Directors of BOC amounted to £147,000 in the year ended 30th September, 1973. The rate at which the emoluments of the present Directors of BOC are paid will not be increased as a result of the transactions described in this Circular save that the Directors appointed to the Board of Airco may receive fees from that Company, such fees yet to be decided.

9. There have been no contracts (not being contracts entered into in the ordinary course of business) entered into within two years immediately preceding the publication of this Circular which are or may be material in the context of the transactions described in this Circular.

10 No Director of BOC has a service contract which does not expire, or which is not terminable by BOC without payment of compensation within one year.

11. Since 30th September, 1973 no assets in which any Director of BOC has any direct or indirect interest have been acquired or disposed of by, or leased to BOC or any of its subsidiaries and no such assets are proposed to be acquired, disposed of or leased.

There are no subsisting contracts or arrangements with BOC or its subsidiaries in which any Director of BOC is materially interested.

12. Mr I. J. Fraser, a Director of BOC, is Deputy Chairman of Lazard Brothers & Co., Limited, to which a fee is payable in connection with the transaction described in this Circular.

13. The expenses of the transactions described in this Circular will be payable by BOC or its subsidiaries and are estimated to be £1·2 million.

14. Except as described herein neither BOC nor any of its subsidiaries has any litigation or claims of material importance pending or threatened against it.

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15. Group Loan Capital and other borrowings of BOC as at 9th February, 1974:

	Secured		*Unsecured*		*Total*	
	£000's	£000's	£000's	£000's	£000's	£000's
Long Term:						
BOC Debenture Stock	13,525		—		13,525	
BOC Tonnage Debenture Stocks	23,500		—		23,500	
Other Long Term Loans	15,188		57,649		72,837	
		52,213		57,649		109,862
Short Term (less than 5 years)		4,372		34,399		38,771
Bank Overdrafts		4,919		15,818		20,737
		61,504		107,866		169,370

The above figures include the borrowing made to acquire the 4 million shares of Common Stock of Airco. All currency figures are converted at the rates of exchange ruling on 9th February, 1974.

Save as aforesaid and apart from inter-company liabilities neither BOC nor any of its subsidiaries had outstanding any bank overdrafts or other similar indebtedness, acceptances (other than normal trade bills), acceptance credits, mortgages, or charges. Since 9th February, 1974 the above figures have not changed materially. The guarantees and other material contingent liabilities of the Group as at 30th September, 1973 were £8·1 million of which £6·7 million related to subsidiary company borrowings included in the consolidated balance sheet. In the opinion of the Directors the only material change in these as at 9th February, 1974, were the guarantees of $80 million (£34·5 million) given in respect of the borrowings of B.O. Investments for the purchase of the 4 million shares of Common Stock of Airco.

Documents available for inspection

Copies of the following documents are available for inspection at the offices of Linklaters & Paines, Barrington House, 59/67, Gresham Street, London EC2V 7JA during the usual business hours on weekdays (Saturdays excepted) until 21st March, 1974.

(a) Memorandum and Articles of Association of BOC;

(b) Documents relating to the Tender Offer by BOC Financial Corporation for Airco;

(c) Audited Accounts of BOC for the two years ended 30th September, 1972 and 1973;

(d) Annual Report and Audited Accounts of Airco for the year ended 31st December, 1972 and, when available, for the year ended 31st December, 1973;

(e) Documents of Incorporation of BOC Financial Corporation;

(f) Memorandum Agreements dated 25th July, 1973; 10th December, 1973; and 21st December, 1973, between BOC and Airco.

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COMMERCE PUBLICATION

PRELIMINARY REPORT

1972 CENSUS OF MANUFACTURES

INDUSTRY SERIES

MC72(P)-28A-2
Issued March 1974

U.S. DEPARTMENT OF COMMERCE • Social and Economic Statistics Administration • BUREAU OF THE CENSUS

GX-296-A

Industrial Gases, SIC 2813

The Industrial Gases Industry includes establishments primarily engaged in manufacturing gases for sale in compressed, liquid, and solid forms.

Establishments primarily engaged in manufacturing fluorine and sulfur dioxide are classified in industry 2819; household ammonia in industry 2812, other ammonia in industry 2873; and chlorine in industry 2812. Distributors of industrial gases and establishments primarily engaged in shipping liquid oxygen are classified in trade.

The classification of establishments for which data are tabulated in this report is based upon the definitions and coding structure contained in the 1972 edition of the Standard Industrial Classification (SIC) Manual, published by the Office of Management and Budget, Executive Office of the President.

The statistics for this industry as classified under the 1972 edition of the SIC manual were unchanged as to code number or content from the previous classification system.

In 1972, the value of products shipped and miscellaneous receipts of establishments classified in the Industrial Gases Industry amounted to $673 million, an increase of 14 percent compared with 1967. Value added by manufacture at $363 million in 1972 was 15 percent above value added in 1967. Average employment in the industry showed a decrease of 9 percent from 1967 to a total of 9.1 thousand employees in 1972.

Of the $673 million total value of shipments and other receipts of establishments classified in the Industrial Gases Industry, ($31 million were products primary to other industries) and $47 million were receipts for miscellaneous activities. The industry shipments of primary products represented 95 percent of the total manufactured product shipments, primary and secondary. This percent, called the "specialization ratio" for the industry, was 96 percent in 1967.

The total value of industrial gases shipped by all producers in 1972 was $649 million of which $595 million, or 92 percent, was shipped by plants classified in industry 2813, Industrial Gases, while the remainder was shipped by plants classified in other industries. This percentage, called the "coverage ratio," was 89 percent in 1967.

These ratios were developed to measure the extent to which the industry statistics in tables 1 and 2 may be compared with the product statistics in table 3.

For an explanation of the terms used in the tables, see appendix B at the end of this report.

Comparability of the Census of Manufactures and Current Industrial Reports Data:

For industry 2813, the Census Bureau collects current statistics on selected products. These data appear in the Current Industrial Reports series M28C, Industrial Gases.

For Sale by the Publications Distribution Section, Social and Economic Statistics Administration, Washington, D.C. 20233. Price: 35 cents.

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TABLE 1. General Statistics: 1958 to 1972

(See appendix, Explanation of Terms)

Year	Establishments		All employees		Production workers			Value added by manufacture	Cost of materials, fuels, etc.	Value of industry shipments	Capital expenditures, new	Gross value of fixed assets	End of year inventories	Specialization ratio	Coverage ratio
	Total	With 20 employees or more	Number	Payroll	Number	Man-hours	Wages								
	(number)	(number)	(1,000)	(million dollars)	(1,000)	(millions)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(percent)	(percent)
	INDUSTRY 2813.--INDUSTRIAL GASES														
1972 Census	501	137	9.4	81.6	5.3	10.3	47.0	462.7	212.4	673.1	82.3	(NA)	30.9	(D)	(D)
1971 ASM	(NA)	(NA)	9.1	80.3	4.9	10.0	42.3	478.5	186.7	665.3	57.6	1,001.2	27.1	(NA)	
1970 ASM	(NA)	(NA)	9.6	83.5	5.1	10.6	42.8	516.8	198.9	716.1	60.8	999.7	27.7	(NA)	
1969 ASM	(NA)	(NA)	9.5	80.2	5.0	10.5	37.5	500.1	196.7	696.8	57.1	934.9	26.3	(NA)	(D)
1968 ASM	(NA)	(NA)	9.9	82.9	5.6	10.6	38.5	498.2	192.2	668.3	72.2	967.8	25.2	(NA)	NA
1967 Census	507	136	10.3	78.5	5.8	11.1	39.6	466.9	188.8	588.7	123.7	932.0	21.2	96	97
1966 ASM	(NA)	(NA)	9.4	74.6	4.9	10.5	33.5	453.1	190.4	549.7	97.0	(NA)	18.3	(NA)	(D)
1965 ASM	(NA)	(NA)	10.1	72.2	5.3	11.2	35.2	446.7	191.2	540.0	63.8	(NA)	16.9	(NA)	
1964 ASM	(NA)	(NA)	10.2	72.7	5.6	11.7	37.2	360.0	184.5	507.3	73.1	692.6	16.3	(NA)	
1963 Census	456	131	9.8	68.8	5.2	11.1	33.5	412.2	174.8	420.4	93.5	618.1	17.2	96	97
1962 ASM	(NA)	(NA)	9.3	65.2	5.2	11.2	33.1	398.5	170.1	382.3	94.6	538.9	15.3	(NA)	
1961 ASM	(NA)	(NA)	8.7	61.5	4.8	10.4	32.1	374.5	164.0	354.2	91.6	(NA)	14.1	(NA)	
1960 ASM	(NA)	(NA)	10.2	71.6	5.4	12.1	33.4	422.1	191.6	378.1	42.6	(NA)	14.1	(NA)	
1959 ASM	(NA)	(NA)	10.2	70.1	5.7	11.6	30.2	396.7	178.7	337.1	39.5	(NA)	13.9	(NA)	
1958 Census	491	177	10.6	66.7	5.8	12.7	30.6	374.2	163.2	277.1	38.6	(NA)	(NA)	(D)	(D)

Note: All data are based on a representative sample of establishments canvassed in the Annual Survey of Manufactures (ASM). These data differ from the results of a complete canvass of all manufacturing establishments. The 1972 ASM percentage standard errors of estimate for [illegible] and value added by manufacture are [illegible] percent, respectively. Similar measures of error for other values are published in the ASM report for that year. [illegible] 1972 ASM value for industry 2813 was 1 thousand workers and 100 million in value added with corresponding standard errors of estimate of 11.2.

Data prior to 1958 [illegible] 1967 Census of Manufactures, in table 1 of the chapter devoted to the industry.

(NA) Not available.

TABLE 2. General Statistics, by Geographic Areas: 1972 and 1967

(See appendix, Explanation of Terms)

Geographic area	1972											1967	
	Establishments		All employees		Production workers			Value added by manufacture	Cost of materials, fuels, etc.	Value of industry shipments	Capital expenditures, new	All employees	Value added by manufacture
	Total	With 20 employees or more	Number	Payroll	Number	Man-hours	Wages						
	(number)	(number)	(1,000)	(million dollars)	(1,000)	(millions)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(1,000)	(million dollars)
	INDUSTRY 2813.--INDUSTRIAL GASES												
United States, total	501	137	9.4	81.6	5.3	10.3	47.0	462.7	212.4	673.1	82.3	10.3	[illegible]
New Jersey	23	9	.5	4.7	.3	.5	2.4	26.7	6.7	33.6	.6	.7	[illegible]
North Central Region	133	41	2.7	23.2	1.5	2.9	13.2	150.0	65.7	214.0	18.6	2.8	[illegible]
East North Central Div.	96	25	1.8	15.2	1.1	1.9	8.8	102.4	40.3	143.3	12.4	2.1	[illegible]
Ohio	50	10	.6	5.7	.3	.7	3.2	40.6	15.6	56.1	5.0	.9	[illegible]
Illinois	20	6	.4	3.7	.2	.4	1.9	20.0	8.3	28.5	(D)	.5	[illegible]
West North Central	37	16	.9	8.1	.5	1.0	4.4	47.6	25.3	70.6	6.2	.7	[illegible]
Kansas	11	9	.6	5.0	.3	.6	3.1	38.6	20.2	56.3	(D)	.3	[illegible]
South Region	176	72	5.3	27.2	3.0	5.5	19.7	158.4	83.2	211.7	32.8	3.1	[illegible]
Virginia	9	2	.1	1.1	.1	.1	.6	5.6	1.1	7.0	.1	(NA)	[illegible]
West Virginia	11	5	.2	2.1	.1	.2	1.1	20.8	8.2	29.0	(D)	(NA)	[illegible]
Georgia	9	2	.2	1.1	.1	.1	.8	4.0	2.6	6.6	.2	.2	2.1
West South Central Div.	66	16	1.2	9.0	.6	1.2	4.7	61.7	29.7	91.5	39.1	1.0	[illegible]
Louisiana	16	1	.1	2.8	.1	.3	1.4	20.6	6.8	27.4	10.5	.2	[illegible]
Colorado	7	1	.1	.8	.1	.1	.6	4.8	1.8	6.6	(D)	(NA)	(NA)
Pacific Division	66	20	1.1	12.5	.6	1.3	6.3	19.1	21.7	71.5	1.7	1.7	[illegible]
Washington	8	2	.1	1.1	.1	1	.5	1.2	1.0	5.3	.1	.2	[illegible]

Note: Each [illegible] is limited to establishments in that [illegible] Data for individual states [illegible] this [illegible] of individual companies [illegible] in the State.

(NA) Not available. (D) Withheld [illegible] of individual companies.

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TABLE 3. Quantity and Value of Products: 1972 and 1967

(Includes quantity and value of the products reported not only by establishments classified in this industry but also by establishments classified in other industries, and shipping these products as "secondary" products. See appendix, Explanation of Terms "Value of shipments")

1972 product code	Product	Unit of measure	1972			1967		
			Production for all purposes	Total product shipments including interplant transfers		Production for all purposes	Total product shipments including interplant transfers	
				Quantity	Value (million dollars)		Quantity	Value (million dollars)
2813- --	INDUSTRIAL GASES, TOTAL							
	As reported in census of manufactures	.....	(X)	(X)	[1]648.8	(X)	(X)	[1]543.4
	As reported in Current Industrial Reports M28C[2]	.....	(X)	(X)	[1]598.8	(X)	(X)	[1]588.1
28132 --	Acetylene:							
28132 00	As reported in census of manufactures	.....	(X)	(X)	[1]95.3	(X)	(X)	93.3
	As reported in Current Industrial Reports M28C[2]	Mil.cu.ft.	[3]11,568	7,238	94.5	[3]14,269	8,176	87.1
28133 --	Carbon Dioxide:							
28133 00	As reported in census of manufactures	.....	(X)	(X)	[1]45.6	(X)	(X)	48.0
	As reported in Current Industrial Reports M28C[2]	1,000 s. tons	1,481.3	1,371.5	39.2	1,089.3	971.6	47.4
28132 11	Liquid and gas	...do.....	[4]1,171.8	1,064.8	23.4	[4]717.2	618.9	29.4
28133 31	Solid (dry ice)	...do.....	306.5	306.7	15.8	372.1	352.7	18.0
28134 --	Elemental Gases and Compressed and Liquefied Gases, N.E.C.							
28134 00	As reported in census of manufactures	.....	(X)	(X)	[1]479.2	(X)	(X)	390.8
	As reported in Current Industrial Reports M28C[5]	.....	(X)	(X)	465.1	(X)	(X)	453.5
28134 15	Argon, high purity (99.97-100%)	Mil.cu.ft.	3,804	3,804	33.1	1,912	1,910	25.5
	Helium[6]	...do.....	(NA)	(NA)	(NA)	4,712	907	(NA)
28134 20	Hydrogen	...do.....	[7]58,890	17,952	30.3	[8]158,539	27,666	39.1
28134 40	Nitrogen[9]	...do.....	193,540	176,833	130.3	[8]103,933	[8]91,941	[8]69.6
	Gas	...do.....	127,960	112,889	33.4	(NA)	(NA)	(NA)
	Liquid	...do.....	65,580	63,944	96.9	(NA)	(NA)	(NA)
28134 50	Oxygen	...do.....	353,190	301,756	216.8	272,835	[8]220,802	[8]208.8
	Gas	...do.....	(NA)	247,538	123.4	(NA)	(NA)	(NA)
	Liquid	...do.....	(NA)	54,218	93.4	(NA)	(NA)	(NA)
28134 71	Nitrous oxide	Mil. gal. (STP).	1,278.3	1,278.3	4.5	953.1	953.6	4.4
28134 98	Other industrial gases, n.e.c., including crude argon, carbon dioxide produced and transferred for further processing, and crude and high purity helium produced in privately owned plants[10]	.....	(X)	(X)	50.1	(X)	(X)	[10]76.1
28130 00	Industrial gases, n.s.k., as reported in census of manufactures for companies with 10 employees or more. (See note)	.....	(X)	(X)	25.2	(X)	(X)	19.8
28130 02	Industrial gases, n.s.k., as reported in census of manufactures for companies with less than 10 employees. (See note)	.....	(X)	(X)	3.5	(X)	(X)	3.6

Note: In the census of manufactures, data for establishments of small companies, typically those with less than 10 employees, were estimated from administrative records rather than collected from respondents. These estimated shipments which are further discussed in the appendix are included in the code ending with "002." In addition to the "n.s.k." (code 002) resulting from the above, products which were not completely identified on the standard forms were coded to the appropriate product class code (5 digits) followed by "00," or in some cases to the appropriate product group code (4 digits) followed by "000."

(X) Not applicable. (NA) Not available. n.e.c. Not elsewhere classified. n.s.k. Not specified by kind.

[1] Excludes value for helium produced in government owned plants.

[2] For more detailed data on selected industrial gases, see the Current Industrial Report M28C, "Industrial Gases."

[3] Excludes information from railroad ships, shipyards, welding shops, and small establishments using portable generators.

[4] Excludes production of liquid and gas carbon dioxide converted to and reported as dry ice and also amounts converted from pure carbon dioxide (liquid or solid) purchased or received from other plants. Also excludes quantities produced and consumed in plants manufacturing soda ash or urea, and quantities produced and transferred to other plants where it is further processed.

[5] Source: U.S. Department of Interior, Bureau of Mines.

[6] Excludes amounts vented, used as fuel, etc., and amounts produced and consumed in the manufacture of synthetic ammonia and methanol, but includes an unspecified amount produced for sale or interplant transfer to plants consuming this gas in the production of ammonia. Also excludes amounts produced by the ammonia dissociation process (cracking of ammonia). Also excludes amounts produced in petroleum refineries for captive use. However, of the total shown for 1967, 70 to 75 percent was accounted for by petroleum refiners with captive lower purity hydrogen production. Not all such petroleum refineries were canvassed in this survey.

[7] Excludes amounts produced and consumed in the manufacture of synthetic ammonia or ammonia derivatives.

[8] Data for 1967 includes only high purity gas. Value of shipments data for lower purity gas is combined with code 28134 98 for 1967.

[9] Excludes hydrocarbon gases such as propane, butane, and propylene, or halogenated hydrocarbons and cyclopropane, which are reported to the U.S. Tariff Commission. Also excludes sulfur dioxide and chlorine, figures for which are shown in Current Industrial Reports series M28A(72)-11, Inorganic Chemicals.

[10] Includes values for lower purity nitrogen and lower purity oxygen for 1967.

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Appendix A. SCOPE AND COVERAGE

This report is one of a series presenting preliminary information on industries and products from the 1972 Census of Manufactures. The data will be superseded in a final report which in turn will be included in *Volume II, Industry Statistics, 1972 Census of Manufactures.* The final report will include a comprehensive discussion of the concepts and definitions used in the census.

The census of manufactures covers each manufacturing establishment in the United States with one paid employee or more; manufacturing establishments with no employees are excluded from this census. Firms which operate more than one establishment were required to file a separate report for each location. Companies which engaged in distinctly different lines of activity at one location were asked to submit separate reports if the company records permitted such a separation and the activities were of significant size.

This report does not include figures for administrative offices, warehouses, garages, or other auxiliary units which service manufacturing establishments of the same company.

In the 1972 census, as in the 1967 census, approximately 120,000 manufacturing firms with less than 10 employees were excused from filing reports. Under special arrangements which safeguarded the confidentiality of both tax and census records, limited data (payrolls, sales, and industry classification) from the administrative records of the Social Security Administration (SSA) and the Internal Revenue Service (IRS) were made available to the Census Bureau for use in the 1972 Economic Censuses (Retail and Wholesale Trade, Service Industries, Construction Industries, Manufactures, and Mineral Industries). Estimates for data other than payrolls and sales for these small establishments were developed from industry averages. The effect on industry aggregates is slight in most industries. For manufacturing as a whole, they account for less than 3 percent of the payrolls and value added. In industry 2813, these small establishments accounted for approximately 0.8 percent of payrolls and 0.6 percent of value added by manufacture. Detailed product and materials data for these small establishments were not estimated. The entire estimated value of shipments and cost of materials were imputed to "not specified by kind" categories.

As in earlier censuses, a number of small establishments may have been misclassified as to industry. However, such possible misclassifications have no significant effect on the statistics other than the number of establishments. As indicated above, report forms were not mailed to very small establishments (less than 10 employees). The industry classifications for these establishments were assigned on the basis of brief descriptions of the general activity of the establishment.

Where the description is incomplete or there are relatively fine lines of demarcation among industries or between manufacturing and nonmanufacturing activity, the code assigned to an establishment could differ from that which would have been assigned on the basis of more complete product or activity information. Therefore, the total establishment count should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the total number of establishments.

The general statistics (employment, payrolls, cost of materials, value added by manufacture, value of shipments) appearing in tables 1, 2 and 4 are reported for each establishment as a whole. Thus, these data reflect not only the primary activities of the establishments, which determine their industry classification, but also all secondary activities as well. This fact should be taken into consideration when comparing the data in tables 1, 2, and 4 with the value of products appearing in table 3. The data in table 3 provide information on the value of the primary products of the industry shipped by all manufacturing establishments whether they are classified in the industry or in other industries and producing the products as secondary products.

More detailed figures for this industry will appear in the final census reports. Final reports will also include a comprehensive discussion of such concepts as "industry," "establishments," and "secondary production," as well as the various statistical items such as "employment," and "value added." Similar preliminary and final reports will be issued for other industries during the coming months. A series of preliminary summary reports showing U.S. totals for each manufacturing industry and for each State are being issued. Final industry reports and final area reports will be published during 1974.

Order forms showing these reports and their prices may be obtained from any U.S. Department of Commerce district office or from the Publications Distribution Section, Social and Economic Statistics Administration, Washington, D.C., 20233.

The 1972 Census of Manufactures is the 29th census of manufacturing establishments in the United States. For 1972, it was conducted jointly with the censuses of mineral industries, construction industries, retail trade, wholesale trade, and selected services under authority of Title 13 of the United States Code. Title 13 specifies that a census of manufactures be conducted every 5 years, to cover years ending in "2" and "7". Title 13 also authorizes an annual sample survey of manufacturing establishments in interim years.

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Appendix B. EXPLANATION OF TERMS

(For a more complete discussion of these terms and the method of compiling the Census of Manufactures, see the "Introduction" to the 1967 Census of Manufactures, Volume III).

All Employees—All full-time and part-time employees on the payrolls of operating manufacturing establishments for any part of the pay period ended nearest the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employee" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average of those for midmonth payroll periods of March, May, August, and November.

Payroll—This item includes all forms of compensation such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of these establishments, if a corporation; it excludes payments to the proprietor or partners, if an unincorporated concern. Respondents were told that in reporting they could follow the definition of payrolls used for calculating the Federal withholding tax.

Production and Related Worker Man-Hours—This total relates to production worker man-hours worked or paid for at the plant including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave when the employee was not at the plant.

Cost of Materials—The term "cost of materials" refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed regardless of whether these items were purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (a) all raw material, semifinished goods, parts, components, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year; (b) electric energy purchased; (c) fuels consumed for heat, power, or the generation of electricity; (d) work done by others on materials or parts furnished by manufacturing establishments (contract work); and (e) products bought and resold in the same condition.

Specific Materials Consumed—In addition to the total cost of materials which every establishment was required to report, information was also collected for many manufacturing industries on the consumption of major materials used in manufacturing. These materials inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Information regarding the specific materials consumed is shown in table 4, if appropriate to this industry. Establishments consuming less than a specified amount (usually $5,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which administrative records used were imputed as "not specified by kind." (See "Scope and Coverage" for importance of administrative records in the industry.)

Value of Shipments—The amounts under value of shipments are the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts such as receipts for contract work performed for others, installation and repair, sales of scrap, and sale of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value; i.e., including not only the direct costs of production but also a reasonable proportion of "all other costs" (including company overhead) and profit.

Shipment of Individual Products—In the 1972 census program, more detailed shipment information was collected on the output of approximately 10,000 individual products. These products are identified by a 7-digit code and are grouped into approximately 1,200 classes of products which in turn are primary to about 450 4-digit industries. Data at the 5-digit product-class

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level have been collected each year as part of the Annual Survey of Manufactures. Information at the 7-digit level is collected in the quinquennial Census of Manufactures program and, for many industries, in the Current Industrial Reports program of the Bureau.

Typically, both quantity and value of shipments information were collected. However, if there was no meaningful physical quantity measure that could be reported by manufacturers, only value of shipments was collected. Insofar as other measures were collected for selected products, they are shown in table 3.

Value Added by Manufacture—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments for products manufactured plus receipts for services rendered. The result of this calculation is then adjusted by the net change in finished goods and work-in-process inventories between the beginning and end of the year.

"Value added" avoids the duplication in the value of shipments figure which results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

Expenditures for Plant and Equipment—For establishments in operation and establishments under construction but not yet in operation, manufacturers were asked to report their expenditures for (a) permanent additions and major alterations to manufacturing establishments, and (b) new machinery and equipment used for replacement purposes and additions to plant capacity if they are of the type for which depreciation accounts are ordinarily maintained.

These totals exclude that portion of expenditures for new facilities and equipment leased from nonmanufacturing concerns, new facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations. Expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses are also omitted from the figures for new capital expenditures.

End-of-Year Inventories—Respondents were asked to report their inventories at approximate current costs if feasible; otherwise, at book values. Since different methods of inventory valuation are used (LIFO, FIFO, etc.), the definition of the value of the inventories aggregated for all establishments in an industry is not precise. The figures on change in inventory between years are of considerably greater significance than the measurement of the level of inventories.

Gross Value of Fixed Assets—This statistic is included with the basic general statistics for the first time in the 1972 Census of Manufactures. The information, however, is collected in the annual survey of manufactures sample and is thus subject to sampling error. The sampling errors will be included in the special census report on Gross Book Value of Depreciable Assets and Rental Payments. Approximate sample errors for 1972 can also be obtained from the 1971 Annual Survey of Manufactures. The data cover all fixed assets on the books of establishments at the end of the year for which depreciation accounts are maintained. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all buildings, structures, and machinery and equipment. Excluded are nondepreciable assets; for example, inventories and intangible assets such as patent rights and royalties. Also excluded are land and depletable assets such as timber and mineral rights.

GENERAL INSTRUCTIONS

A separate Census report is required for each business location. Therefore, based on Census records, a report form is provided for each location which your company operated in 1972.

For purposes of the Census, a **manufacturing establishment** is defined as a single physical location where manufacturing operations are performed (e.g., a factory, mill, or plant). Thus a separate report is required for different physical locations even though the establishments may be engaged in the same line of manufacturing.

Please note that establishments engaged in the following activities are also considered to be manufacturing for the purposes of this Census: Poultry dressing; milk pasteurizing and bottling; seafood, fresh packaged or frozen; apparel jobbing and contracting, logging camps and logging; sawmills; printing; publishing – book, magazine, periodical, etc.; manufacturing and delivering ready-mixed concrete, machine shops, including those operating on a job order basis; job casting, stamping, machining; plating, galvanizing, polishing materials owned by others, etc.; ship and boat repairing.

In completing this report, a limited amount of prorating or estimating is acceptable if book records are not readily available. Include all the activities conducted within the establishment: e.g., manufacturing, fabricating, processing, and assembling, maintenance of plant and equipment, [illegible], warehousing, storage, research, recordkeeping, health, safety [illegible] and other services.

Each report should cover the calendar year 1972. However, a report is required even if the establishment operated only part of the year. If your book records are not on a calendar year basis, carefully prepared estimates will be acceptable. If reporting on a calendar year basis will require considerable additional costs, and your fiscal year covers at least 10 months of the calendar year 1972 (i.e., ends between October 31, 1972 and February 28, 1973) you may report on a fiscal year basis. However, all employment, payroll, and man-hour figures should relate to the calendar year rather than the fiscal year. (Calendar year payroll records should be available from your tax records.)

In the certification, enter the exact dates of the period covered by the report. If the ownership changed during the year, complete the report only for that part of 1972 in which your company owned and operated the establishment. Report in item 13 the appropriate information on changes in ownership or operations.

If additional report forms are needed, write to the Bureau of the Census, 1201 **East Tenth Street, Jeffersonville, Indiana 47130.** Be sure to describe the type of activity of the establishments for which the additional report forms are requested.

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INSTRUCTIONS FOR ITEMS 1 THROUGH 14

▶ **Item 1A and 1B – Physical Location and Employer Identification Number –** Accurate and precise information on the physical location of each establishment is needed in order to prepare the tabulations of manufacturing activity in each **State, county, and city.** Each establishment has tentatively been coded geographically based on the street address in the mailing label, on the assumption that the physical location and mailing address are the same. Please be certain to complete item 1A, part a, if this is not so. Item 1A, part b, and part c, must be completed even if the physical location and the mailing address are identical. Although the system devised by the Census Bureau codes adequately to State and county in all instances, in many localities it cannot clearly distinguish an address that is in the city from one that is out of the city.

Be certain to enter in item 1B, the current Employer Identification Number if it is different from the one printed in the address label. **This information is needed so that the Census Bureau can avoid sending duplicate report forms for the same location.** Our file of new business formations is based on the new employer identification numbers issued each year. However, we exclude mailing report forms to new employer identification numbers if we identify them as belonging to existing respondents.

(Definitions of employees and payrolls used to calculate withholding taxes generally may be followed in completing items 2 and 3A, Employment and Payrolls.)

▶ **Item 2 – Number of Employees –** Report employees at the establishment who worked or received pay for part of the pay period including the 12th of specified months (March, May, August, and November). Include all persons on paid sick leave, paid holidays, and paid vacation during these pay periods; exclude members of Armed Forces and pensioners carried on your active rolls. Include officers of this establishment, if a corporation, if an unincorporated concern,

Include also cost of materials owned by you but consumed by other companies to make products for your establishment under contract. (The value of these products should be reported in item 18). Amounts paid to other companies for such contract work should be reported on Line 5e and should include freight in and out.

Include **only physical goods used** or put into production.

Exclude services used or overhead charges, such as advertising, telephone, telegram and cable, insurance, developmental and research; services of engineering, management, marketing and other professional consultants, etc., unless charges for such services are included in the prices paid for materials.

Exclude also overhead items such as depreciation charges against plant and equipment; rent and rental allowances; interest payments, royalties, and patent fees.

Exclude materials, supplies, machinery, and equipment which were used in the construction of new structures or additions to your plant, or new machinery and equipment, and which are chargeable to fixed assets accounts. Exclude products purchased and resold without further manufacture or processing or assembly, their costs should be included in item 5b.

▶ **Item 5b – Cost of Products Bought and Resold –** Report the cost of all products bought and resold in the same condition as when purchased and not made part of another product manufactured by this establishment. (Total sales value of all products resold is to be reported in item 18 on the line for resales.)

▶ **Item 5c – Cost of Fuels Consumed –** Report the total amount actually paid or payable during the year for all fuels consumed for heat, power, trans[illegible]

bers of Armed Forces and pensioners carried on your active rolls. Include officers of this establishment, if a corporation, if an unincorporated concern, exclude proprietor, or partners.

▶ **Items 2a–2d – Number of Production Workers** – Workers (up through the working foreman level) engaged in fabricating, processing, assembling, inspecting, receiving, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial, watchman services, product development, auxiliary production for plant's own use (e.g., powerplant), recordkeeping, and other closely associated services. Exclude proprietors and partners.

▶ **Item 2g – All Other Employees** – Nonproduction personnel, including those engaged in the following activities; supervision above working foreman level, sales (including driver salesmen), sales delivery (truck drivers and helpers), advertising, credit, collection, installation and servicing of own product, clerical and routine office functions, executive, purchasing, finance, legal, personnel (including cafeteria, etc.), professional and technical. Exclude proprietors and partners.

▶ **Item 3A – Payrolls** – Report the gross earnings paid in the calendar year to employees at the establishment prior to such deductions as employee's Social Security contributions, withholding taxes, group insurance premiums, union dues, and saving bonds.

Include in gross earnings commissions, dismissal pay, paid bonuses, vacation and sick-leave pay, and the cash equivalent of compensation paid in kind.

Include salaries of officers of this establishment, if a corporation; if an unincorporated concern, exclude payments to proprietors or partners.

Exclude payments to agricultural employees, fishermen, members of the Armed Forces, and pensioners carried on your active payroll.

▶ **Item 4 – Plant Man-Hours of Production Workers by Quarter** – Include all man-hours worked or paid for, except hours paid for vacations, holidays, or sick leave. If an employee elects to work during the vacation period, report only actual hours worked by such employee. Overtime hours should be reported as actual hours worked, not straight-time equivalent hours.

▶ **Item 5 – Cost of Materials** – Report total cost of the materials **actually consumed** or put in production during the year.

If there are no records of consumption, purchases may be reported instead for minor items. This can also be done for major items if purchases do not differ significantly from the amounts actually used. Where consumption of major items differs significantly from purchases, consumption may be estimated by adding beginning inventories to the amount purchased and subtracting ending inventories.

Cost is delivered cost – i.e., the amount paid or payable after discounts and including freight and other direct charges incurred by the establishment in acquiring the materials.

Include all materials received for consumption; i.e., purchases from other companies, transfers from other establishments of your own company, withdrawals from inventories.

If the establishment produces items subsequently consumed in further production, report cost of original materials consumed only.

▶ **Item 5a – Cost of Materials, Parts, Components, Containers, etc., Consumed** – The delivered cost figures reported in item 5a should cover all raw materials, containers, scrap, and supplies, etc., which were: (1) put into production, (2) [illegible] supplies, (3) used in repair and maintenance. Item 5a [illegible] item 17.

▶ **Item 5c – Cost of Fuels Consumed** – Report the total amount actually paid or payable during the year for all fuels consumed for heat, power, transportation, or the generation of electricity. Do not include the estimated cost of fuels, such as sawdust or blast furnace gas, produced as a by-product of your manufacturing activities. Include anthracite and bituminous coal, coke, natural and manufactured gas, fuel oil, liquefied petroleum gas, gasoline, and all other fuels including purchased steam.

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▶ **Item 5d – Cost of Purchased Electricity** – Report the total amount actually paid or payable for electric energy purchased during the year from other companies, or received from other establishments of your company. Exclude the value of electricity generated and used at this establishment.

▶ **Item 5e – Cost of Contract Work Done for You by Others on Your Materials** – If any contract work was done by others on materials furnished by your establishment, report the total payments made during the year for such work, including freight out and in. Exclude the cost of materials worked on, which should be included in item 5a.

▶ **Item 6 – Inventories of This Establishment at Beginning and End of Year** – Inventories should be reported at approximate current costs, if feasible; otherwise at book values. It is important that inventories should be reported on a comparable basis at the beginning and end of year.

▶ **Item 7 – Capital Expenditures During Year (Exclude expenditures for land)** – Include all cost actually incurred during 1972 chargeable to the fixed assets accounts and of the type for which depreciation or amortization accounts are ordinarily maintained.

▶ **Item 7a – New Structures and New Additions to Plant (Exclude expenditures for land)** – Report total expenditures during the year for new construction (whether constructed on contract or by your own forces), major alterations, capitalized repairs, and improvement of buildings (including all new elevators, cranes, heating and ventilating equipment essentially a part of the buildings), other fixed structures (such as blast furnaces, brick kilns, fractionating towers, shipways, and similar types of structures), and site improvements (such as roads, docks, tracks, parking lots, fences, utilities).

▶ **Item 7b – New Machinery and New Equipment** – Report total expenditures at this establishment for new production machinery and equipment and other new machinery and equipment. Include replacements as well as additions to capacity. Include all new motors, lathes, punch presses and similar machinery and equipment for use in production, as well as all new office machines and fixtures, furniture, cafeteria and dressing room furnishings, automobiles and trucks, and other similar equipment. Report value of improvement and capitalized repairs to machinery and equipment, whether repairs and improvements were purchased or made by employees of your company.

▶ **Item 7c – Used Plant and Used Equipment Acquired From Others** – Report total expenditures at this establishment for old or existing plants and for second-hand equipment acquired from others (including the U.S. Government). Include at approximate market value machinery or equipment [illegible] other plants of your company.

▶ **Items 13 and 14 – Change in Ownership or Company Affiliation and Organization** – Please complete these items fully if pertinent. Accurate completion of these items will avoid unnecessary correspondence, as well as [illegible] possibility of your receiving more than one [illegible] activity [illegible]

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U.S. DEPARTMENT OF COMMERCE
SOCIAL AND ECONOMIC STATISTICS ADMIN.
BUREAU OF THE CENSUS

1972 CENSUS OF MANUFACTURES

INDUSTRIAL GASES

NOTICE – Response to this inquiry is required by law (Title 13, U.S. Code). By the same law, your report to the Census Bureau is confidential. It may be seen only by sworn Census employees and may be used only for statistical purposes. The law also provides that copies retained in your files are immune from legal process.

In correspondence pertaining to this report, please refer to this Census File Number

Employer Identification Number

CY-285-5

Please complete and return this form as soon as possible after receipt to:

BUREAU OF THE CENSUS
1201 East Tenth Street
Jeffersonville, Indiana 47130

PLEASE READ ACCOMPANYING INSTRUCTION SHEET AND INSTRUCTIONS WITH EACH ITEM BEFORE COMPLETING

If book figures are not available, carefully prepared estimates are acceptable. Complete every item. Please enter the 11-digit number in the Census File Number space provided at the top of all odd-numbered pages.

If filing by due date causes an undue burden, a request of an extension of time should be sent to the above address. Please mention the 11-digit Census File Number in the upper left of the address box if you write regarding this report.

(Please correct any error in name and address including ZIP code)

ITEM 1 PHYSICAL LOCATION OF MANUFACTURING ESTABLISHMENT

The purpose of this inquiry is to determine the place (city, county, etc.) where your plant is actually located (which may differ from the mailing address) so that the data can be tabulated in the correct geographic area.

a. Is your manufacturing establishment physically located at the address shown in the address box in the right hand corner of this form?

☐ NO – Enter PHYSICAL location here

Also answer b and c

*Street name and number

Place (City or village, etc.)

☐ YES

Answer b and c

State | ZIP code

*If location cannot be described by street name and number, give as much information as possible such as street intersection, highway number or distance from nearest town, etc.

b. Is your manufacturing establishment located WITHIN the LEGAL boundaries of the city, village, etc., which you indicate is its PHYSICAL location?

1 ☐ YES 2 ☐ NO

c. In what county is your manufacturing establishment PHYSICALLY located?

County

ITEM 2 EMPLOYER IDENTIFICATION NUMBER(S)

a. Is the Employer Identification (E.I.) Number in the upper right of the address box the SAME as that used for this establishment on your latest 1972 Employer's Quarterly Federal Tax Return, Treasury Form 941?

Complete each item, enter "0" when appropriate

		Key	Mil. 000	Thou. 000	Hrs. 000
ITEM 4 Plant man-hours of production workers by quarter	a. January through March	314			
	b. April through June	315			
	c. July through September	316			
	d. October through December	317			
	e. TOTAL MAN HOURS (Item 4) →	318			

		Key	Mil. $000	Thou. 000	Dol. 000
ITEM 5 Cost of materials, resales, fuels, electricity, and contract work (Delivered cost including freight and other	a. Cost of materials, parts, components, containers, etc., consumed	321			
	b. Cost of products bought and resold	322			

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1972 Employer's Quarterly Federal Tax Return, Treasury Form 941 (9 digits)

☐ YES ☐ NO – Enter currently assigned E.I. number

b. Did this establishment also use any other Employer Identification (E.I.) Number(s) during 1972? (9 digits)

☐ YES – Enter E.I. number or numbers →

☐ NO

IMPORTANT – Dollar and man-hour figures should be reported in thousands. If you wish, you may report to the nearest unit. Please be careful to enter your figures in the correct columns.

EXAMPLE – If the payroll is $1,125,628:	Millions $000	Thousands 000	Dollars 000
• PREFERRED METHOD →	1	126	
Acceptable method →	1	125	628

Complete each item, enter "0" when appropriate. 3

ITEM 2 – Number of employees

		Key	Number
Number of production workers during pay period including 12th of month	a. March	301	
	b. May	302	
	c. August	303	
	d. November	304	
e. Sum of lines a–d →		305	
f. Average number (divide line e by 4, omit fractions)		306	
g. All other employees (pay period including March 12th)		307	
h. TOTAL EMPLOYMENT (Sum of lines f and g, Item 2) →		308	

ITEM 3A – Payrolls

	Key	Mil. $000	Thou. 000	Dol. 000
a. Production workers' wages	311			
b. All other salaries and wages	312			
c. TOTAL PAYROLL (Item 3A) →	313			

ITEM 3B Not applicable to this form.

ITEM 4 – Supplemental labor costs (Payroll taxes, insurance, pensions, welfare, vacation, bonuses, etc.)

ITEM 5 – Cost of materials, supplies, fuels, etc., consumed during year (Include freight and other direct charges)

	Key	Mil. $000	Thou. 000	Dol. 000
a. Cost of materials and supplies consumed	321			
b. Cost of resales	322			
c. Cost of fuels consumed	323			
d. Cost of purchased electricity	324			
e. Cost of contract work done for you by others on your materials	325			
f. TOTAL COST (Item 5) →	326			

CX-298-5-1

ITEM 6 – Inventories of this establishment (Valuation should be on a comparable basis for both periods)

	JANUARY 1, 1972 Key	Mil. $000	Thou. 000	Dol. 000	DECEMBER 31, 1972 Key	Mil. $000	Thou. 000	Dol. 000
a. Finished products	331				335			
b. Work-in-process	332				336			
c. Materials, supplies, fuels, etc.	333				337			
d. TOTAL INVENTORIES (Item 6) →	334				338			

ITEM 7 – Capital expenditures during year (exclude land) (See instructions for details)

	Key	Mil. $000	Thou. 000	Dol. 000
a. New structures and new additions to this plant (Exclude land)	341			
b. New machinery and new equipment	342			
c. Used plant and used equipment acquired from others	343			
d. TOTAL CAPITAL EXPENDITURES (Item 7) →	344			

ITEM 8
ITEM 9
ITEM 10
ITEM 11
ITEM 12

Not applicable to this form

4873

Changes in operator or operations during 1972

13 MARK ONE BOX

1 ☐ No change in operator or operations

2 ☐ Reorganized – *Describe in "Remarks," e.g., partnership change or change in corporate status.*

3 ☐ Started new business – *Date* _____

4 ☐ Plant dismantled, abandoned, or destroyed on – *Date* _____

5 ☐ Plant idle or inactive but still owned – *Date* _____

6 ☐ This establishment was purchased or leased from another company – *Complete the following information* →

Name of former operator or owner	Address (Number, street, city, State, ZIP code)	EI Number (9 digits) ☐☐-☐☐☐☐☐☐☐ Date

7 ☐ This establishment was sold or leased to another company – *Complete the following information* →

Name of new operator or owner	Address (Number, street, city, State, ZIP code)	EI Number (9 digits) ☐☐-☐☐☐☐☐☐☐ Date

NOTE → **Is the FIRST DIGIT of your Census File Number (imprinted in the address box) a Zero "0"?** . . . . . ☐ YES – *Complete item 14A, a through d* ☐ NO – *Skip to item 15 below*

Company affiliation and organization

113 a. **Is this company owned or controlled by another company?** . . . 1 ☐ YES – *Complete the following information* → 2 ☐ NO

Name, address, and Employer Identification Number of owning or controlling company	Activity of owning or controlling company (Describe, e.g., manufacturing, retail, wholesale, etc., and chief products sold)
Employer Identification No. ☐☐-☐☐☐☐☐☐☐	

114 b. **Does this company own or control any other companies?** . . . . . 1 ☐ YES 2 ☐ NO

c. **Does this company operate more than one establishment?** . . . . . 1 ☐ YES 2 ☐ NO

d. **Did this company have any manufacturing plants under construction but not in operation at the end of the year?** 1 ☐ YES 2 ☐ NO

If "YES," complete 14B below

Other companies owned or establishments operated

(Complete only if item 14A b or c is marked "YES")

Name, address, and Employer Identification Number	Activity (Describe, e.g., manufacturing, retail, wholesale, etc., and chief products sold)	1972 payroll and sales ($000)		Are payrolls and sales included on page 1 of this report? YES	NO
Employer Identification No. ☐☐-☐☐☐☐☐☐☐		Payroll	$	☐	☐
		Sales	$		

Payroll $ ☐ ☐

Employer Identification No. ☐☐-☐☐☐☐☐☐☐ Sales $

CX-298-C-1

ITEM 15 — CHECKS to assure a complete and accurate report

The Census Bureau reviews your report for omissions, inconsistencies, and unusual ratios. To save you future correspondence about these problems, please make the following checks before returning your report:

(1) Review the report carefully to see that no items are omitted for the year being covered.
(2) Calculate and enter figures for the four "reasonableness" checks below, and review the results.
(3) Correct your report for any errors you find and explain unusual figures in "Remarks."

For most manufacturing establishments, the figures computed usually fall within the ranges indicated.

"Reasonableness" checks	Calculation required for each check	Figures for 1972	Usual range
a. Average hourly wages per production worker	Item 3Aa (Production workers' wages) ÷ item 4e (Total man-hours)	$	$1 – $10
b. Hours worked per week per production worker	Item 4c (Total man-hours) × 20 ÷ item 2f (Average number of production workers)	Hrs.	20 – 60
c. Salaries and wages per dollar of shipments	Item 3Ac (Total payroll) ÷ item 18 (Total value of shipments)	¢	05¢ – 95¢
d. Materials cost per dollar of shipments	Item 5f (Total materials cost) ÷ item 18 (Total value of shipments)	¢	05¢ – 95¢

e. Is the total for Value of Shipments (item 18) greater than the sum for payroll (item 3Ac) plus total Cost of Materials, etc. (item 5f)? ..... ☐ YES ☐ NO – *Explain in "Remarks"*

Remarks

44874

(3-002) U.S. DEPARTMENT OF COMMERCE
SOCIAL AND ECONOMIC STATISTICS ADMIN.
BUREAU OF THE CENSUS

1972 CENSUS OF MANUFACTURES

INDUSTRIAL GASES – Continued

PLEASE ENTER YOUR CENSUS FILE NUMBER

Name of establishment (Same as address box)

Page 3

Item 16 – INDUSTRIAL WATER USE DURING 1972

Please indicate the total quantity of water used by this establishment during the calendar year 1972. Include both fresh and brackish water. Include water recirculated and reused. Report the total annual consumption of water; do NOT report hourly, daily, weekly, or monthly rates of consumption.

(MARK ONE BOX ONLY)

348 3 ☐ Under 20 million gallons 4 ☐ 20 to 99 million gallons 5 ☐ 100 million gallons or more

Item 17 – Not applicable to this form.

Item 18 – PRODUCTS AND SERVICES OF THIS ESTABLISHMENT DURING 1972

Please read the entire list of products and services below before answering this inquiry

INSTRUCTIONS

Report net selling value, f.o.b. plant, after discounts and allowances and exclusive of freight charges and excise taxes.

Include products made elsewhere for this establishment on a contract basis from materials supplied by this establishment. (The cost of these materials should be included in item 5a.)

Exclude products made in this establishment on a contract basis from materials owned by others. Report commission or contract receipts on the appropriate line below. (Exclude materials consumed in making these items, from item 5a.)

Line 12 – RESALES – Report the selling value, f.o.b. plant, of products which were resold as originally purchased and not used in further manufacturing, processing, or assembling of products made in this establishment. Report the cost of these products in item 5b.

Line number	Products and services (A)	Census product code (B-1)		Corresponds to the sum of codes reported on Form MA-28E.2 (B-3)	Total value of shipments, f.o.b. plant (E) Millions (000)	Thousands (000)	Dollars (000)
1	Acetylene (28132)	581 28132 00	9	2813200	564 $		
2	Carbon dioxide (28133)	581 28133 00	7	2813311–2813331	564		
3	Elemental gases and compressed and liquefied gases, n.e.c. (28134)	581 28134 00	5	2813411–2813498	564		
	ALL OTHER PRODUCTS MADE IN THIS ESTABLISHMENT — Describe and report separately for each product whose value was $50,000 or more and not listed above. For all remaining products describe and report a single total value.	581			564		

4875

4	LISHMENT						
5			581			584	
6			581			584	
7			581			584	
8	CONTRACT WORK	Receipts for work done for others on their own materials ..... *(Describe products worked on and kind of work.)*	581 93000 00	8		584	
9	MISCELLANEOUS RECEIPTS	Sales of scrap and refuse	581 99980 13	8		584	
10		Receipts for research and developmental work	581 99980 41	9		584	
11		Other miscellaneous receipts, including receipts for repair work, etc.	581 99980 98	9		584	
12	RESALES	Sales of products bought and resold without further manufacture, processing or assembly in this establishment. (The cost of such items should be reported in item 5b.)	581 99999 00	6		584	
13		**TOTAL** *(Sum of lines 1–12, column (E))*	581 77000 00	8		584 $	

CX-298-D-1

A 4876

Items 19–21 – Not applicable to this form.

Remarks

Item 22

Name of person to contact regarding this report	Address *(Number and street, city, State)*	ZIP code	Telephone: Area code	Number	Extension

CERTIFICATION

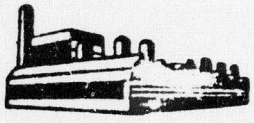
This report is substantially accurate and covers the period from _____ to _____

Name of company	Address *(Number and street, city, State)*	ZIP code

Signature of authorized person	Title	Date

A4877

Current Industrial Reports



U.S. DEPARTMENT OF COMMERCE
SOCIAL AND ECONOMIC STATISTICS ADMINISTRATION
BUREAU OF THE CENSUS
BUREAU OF DOMESTIC COMMERCE

MA-28E.2 (11-2-72)

INSTRUCTION MANUAL

CX-299-A

FOR REPORTING ON FORM MA-28E.2 FOR 1972

INDUSTRIAL GASES
(SHIPMENTS AND PRODUCTION)

ANNUAL REPORT

INTRODUCTION

This manual consists of your instructions for completing your report. Please complete and return the white copy of the report form and retain the completed yellow copy for use as your file copy.

- Part A below gives general instructions about your report.
- Part B explains the format of the report form and how to report the items.
- Part C gives definitions and special instructions you should use in preparing your report.
- Part D contains the reference list of items covered in this survey.

Part A – GENERAL INSTRUCTIONS

1. Filing the report

Return your completed form to the Bureau of the Census, Data Preparation Division, Jeffersonville, Indiana 47130, within 30 days after receipt. We will accept reasonable estimates if your figures are not available within this time period. Please use the preaddressed return envelope that is sent with each report.

We have designed your report form for automatic processing by electronic computers. We would appreciate your using a typewriter to enter all your figures.

If this survey is not applicable to your establishment's operations, please note this fact under the "REMARKS" section of the report form together with a brief description of the principal products manufactured at this establishment and RETURN THE REPORT.

2. Correspondence about your report

In any correspondence with the Census Bureau about your report, please include the title of the survey and the 11-digit file number shown in the address box of your report form.

3. Confidentiality of data

Response to this inquiry is required by law (Title 13, United States Code, Sections 181, 224, and 225, and Section 705 of the Defense Production Act of 1950, as amended). By the same laws (Section 9 of Title 13, United States Code, and Section 705 of the Defense Production Act of 1950, as amended), your report to the Census Bureau and the Bureau of Domestic Commerce is confidential. The individual company information reported on this form is for use in continuing statistical programs of the Census Bureau as well as in defense mobilization activities. The unauthorized publication or disclosure of individual company information filed with the Government on this form is prohibited by law, and persons having access to such information are subject to fine and imprisonment for unauthorized use. The file copy of this report is immune from legal process.

4. Publication of results of this survey

The Census Bureau will publish industry totals in the Current Industrial Reports, Series M-28C, as soon as possible after the necessary reports are received. Companies reporting in this survey can obtain copies of this publication without charge upon request to the Bureau of the Census, Industry Division, Washington, D.C. 20233.

5. Companies receiving blank report forms

The Product Reference List included in the Instruction Manual should be reviewed carefully to determine which of the products covered are applicable to your company. The descriptions and survey item codes for these products should then be transcribed to the report form along with the respective current and previous period data. Please review part B of the Instruction Manual on "HOW TO REPORT" for correct entry of your data.

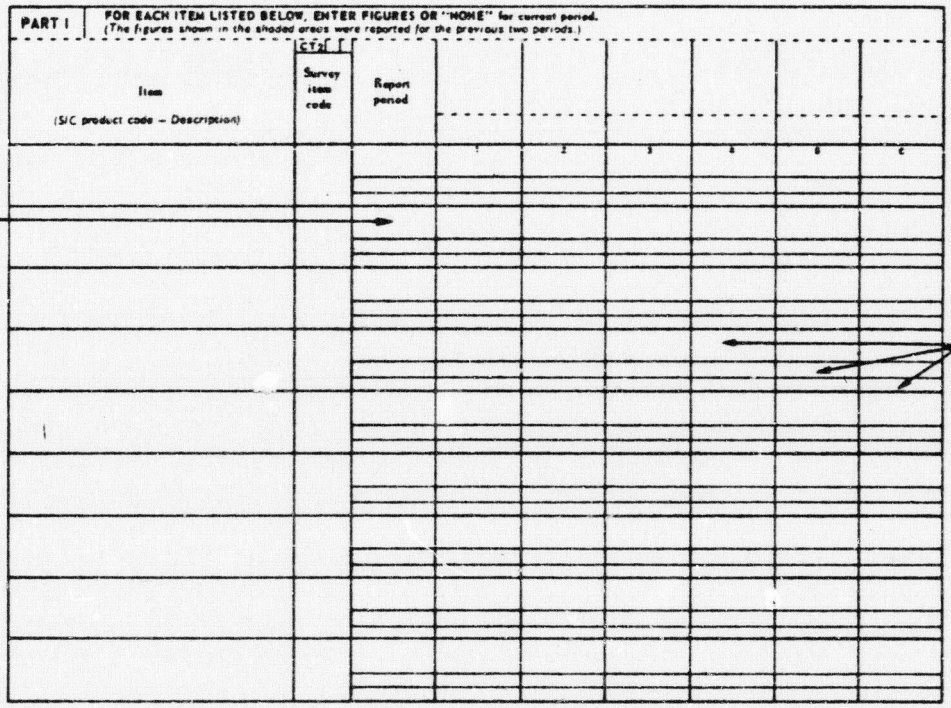
A 4878

CX-299-B

Part B – HOW TO REPORT

1. Reporting of data – Complete part I as shown in the following illustration. All of the items included in this survey are preprinted in part I.

STEP 1: For each item listed, report the figures requested in each of the columns. Enter figures or mark "NONE" on line for current period.



NOTE: Asterisks will appear in shaded lines if figures were not received when this form was prepared. Please enter figures for both current and previous periods.

STEP 2: Compare figures for current and previous periods. Correct previous periods if wrong. Explain substantial differences in "Remarks." *(See par. 4.)*

2. Employer identification number
If your identification number is not preprinted on the form, enter the number used on your Employer's Quarterly Federal Tax Return (U.S. Treasury Department Form 941). If your number is preprinted but is wrong or has changed since your last report, cross it out and enter the correct number. Indicate in "Remarks" the reason for the change (such as reorganized, purchased existing business, etc.).

3. Person to contact
Enter the name and telephone number of the person to contact garding this report, if it is not preprinted on the form. If the preprinted name or telephone number is wrong, cross it out and enter the correct information.

4. Revisions to previous data
We may have changed some of the figures you originally reported either as a result of correspondence with you or because the figures were not consistent with other items you reported.

Please review all the preprinted figures. If any need revision, cross them out and enter the correct ones above them.

Be sure to enter all changes on the file copy of your report form.

5. Reporting period
Report data for the calendar year. If calendar year book figures are not available, except at considerable cost, reasonable estimates will be acceptable.

However, if your fiscal year includes at least 10 months of the calendar year (ends between October 31 and February 28), fiscal year figures will be acceptable.

If there was a change in ownership during the year, or the establishment operated part of the year only, the data should apply to the period of operation by your company only.

A 4879

Cx-299-C

Part C – DEFINITIONS AND SPECIAL INSTRUCTIONS

1. Scope of survey

This form will be used to record annual production, shipments, and consumption data for gases (except liquefied petroleum gases and organic gases, data for which are reported to the U.S. Tariff Commission).

This report should account for all gases produced in this establishment, excluding quantities produced under toll agreement, (where raw materials are furnished you by another firm and the finished product is returned to that firm). The gases for which data are to be reported on this form are listed on the reference list.

Additional copies of this form are available upon request. If it is necessary to use more than one report form, supplemental copies should be carefully identified as to period covered and plant name and location.

2. Figures to be reported

Production – Report in column 1 the quantity of each product listed made in this plant, whether sold, transferred, consumed in this plant, or added to inventory.

Totals reported for gases which appear on the monthly report "Industrial Gases" (marked by * on reference list) should be in agreement with the sum of the twelve monthly figures furnished on the M-28A.2. If these annual figures differ significantly from the sum of the twelve monthly figures, supply in the "Remarks" section, the corrected data for the months revised.

Exclude from production amounts disposed of as waste, vented, used as a fuel, etc. Include products made elsewhere for this establishment on a contract basis from materials supplied by this establishment.

Shipments and interplant transfer – Report in columns 2 and 3 the quantity and net selling value, f.o.b. plant (after discounts and allowances and excluding freight charges) of all products made in this establishment and shipped from it.

Include products transferred to other establishments of your company (such as other manufacturing plants, separate sales branches or retail stores). Their "value" should be the nearest approximation to the commercial selling value, f.o.b. plant, and not the cost of production.

Deduct returned goods.

Method of shipment – The sum of the quantities and values shipped as gas and shipped as liquid should equal the total quantity and value of gases shipped from this location.

Consumption – Report in column 4 the total quantity of each specified product, except carbon dioxide converted to dry ice, which was made in this establishment and was used in further processing within this establishment. These amounts should also be included in "Production."

3. Specific product instructions

Carbon dioxide – Exclude from product code 2813311 (liquid or gas) amounts of carbon dioxide converted to and reported as code 2813331 (solid) and amounts of byproduct carbon dioxide transferred on contract basis for further processing and sale. Also exclude amounts produced and consumed in the manufacture of urea or soda ash. Include natural CO_2 produced from well operations.

Hydrogen – Exclude amounts produced and consumed in the manufacture of synthetic ammonia, synthetic methanol, petroleum products (hydrocracking and hydrotreating), and amounts produced by the ammonia dissociation process (cracking of ammonia).

Nitrogen – Exclude amounts produced and consumed in the manufacture of synthetic ammonia and ammonia derivatives.

4. Units of measure

Report all figures in thousand cubic feet 70°F., at 1 atmosphere pressure, unless otherwise specified.

A 4880

Ca-299-D

Part D – REFERENCE LIST

SIC product code	Item description	Unit of measure	Survey item code
*2813200	Acetylene		
	Produced for pipeline shipment (exclude that shipped to be compressed)	1,000 cu. ft.	2104
	Produced for compression, including cylinder and pipeline		2106
	Produced for consumption in this plant		2109
	Carbon dioxide		
*2813311	Liquid or gas (exclude amounts converted to solid)	Short tons	3130
*2813331	Solid (dry ice)		3140
2813411	Argon, crude (total) (*Report on 100% basis*)	1,000 cu. ft.	4101
*2813415	Argon, high purity		
	Produced for cylinder and bulk delivery shipment		4103
	Produced for pipeline shipment		4104
	Produced for consumption in this plant		4109
*2813420	Hydrogen, including lower purity (*Report on 100% basis*)		
	Produced for cylinder and bulk delivery shipment		4203
	Produced for pipeline shipment		4204
	Liquid produced for government use		4207
	Liquid produced for conversion to gas		4208
	Produced for consumption in this plant		4209
*2813440	Nitrogen, including lower purity (*Report on 100% basis*)		
	Gas (exclude amounts liquefied and reported as liquid)		
	Produced for cylinder and bulk delivery shipment		4313
	Produced for pipeline shipment		4314
	Produced for consumption in this plant		4319
	Liquid		
	Produced for cylinder and bulk delivery shipment (exclude that for bulk shipment to pipelines or to other air separation plants)		4323
	Produced for bulk shipment to pipelines or to other air separation plants		4325
	Produced for consumption in this plant		4329
*2813450	Oxygen, including lower purity (*Report on 100% basis*)		
	Gas (exclude amounts liquefied and reported as liquid)		
	Produced for cylinder and bulk delivery shipment		4413
	Produced for pipeline shipment		4414
	Produced for consumption in this plant		4419
	Liquid		
	Produced for cylinder and bulk delivery shipment (exclude that for bulk shipment to pipelines or to other air separation plants)		4423
	Produced for bulk shipment to pipelines or to other air separation plants		4425
	Produced for consumption in this plant		4429
2813490	Other elemental gases (value only)	XXX	4513
2813471	Nitrous oxide	1000 gal. STP	4613
2813498	Other compressed and liquefied gases (value only)	XXX	4713

*Production of this gas reported on monthly Form M28A.2 "Industrial Gases." (See Special Instruction 2.)

REPORT FOR CALENDAR YEAR 1972

FORM MA28E.2

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

CURRENT INDUSTRIAL REPORTS

ANNUAL REPORT ON SHIPMENTS AND PRODUCTION OF INDUSTRIAL GASES

UNDER JOINT SPONSORSHIP WITH BUREAU OF DOMESTIC COMMERCE

RESPONSE TO THIS INQUIRY IS REQUIRED BY LAW ... to the Census Bureau is confidential by law (Title 13, U.S. Code). The law also provides that copies retained in your files are immune from legal process. See Instruction Manual for specific provisions relating to this survey.

In correspondence pertaining to this report please refer to the file number above your name.

CX-300-A

FILE NUMBER AND NAME AND ADDRESS PREPRINTED ON FORM

(Please correct any error in name and address including ZIP code)

INSTRUCTIONS – Please refer to Instruction Manual before filing this form. Complete and return this form in the envelope provided.

TO: Bureau of the Census, Jeffersonville Census Operations Division, Jeffersonville, Indiana 47130

EMPLOYER IDENTIFICATION NUMBER
Enter if not shown → Identification Number used on Employer's Quarterly Federal Tax Return (U.S. Treasury Department Form 941).

EI # Preprinted (Correct number if wrong)

Person to be contacted (Name – Enter if not shown – Correct if wrong) →

Area code and telephone No. (Enter if not shown – Correct if wrong) → Area code | Number

A 4881

PART I FOR EACH ITEM LISTED BELOW, ENTER FIGURES OR "NONE" for current period. *(The figures shown in the shaded areas were reported for the previous two periods.)*

Item (SIC product code – Description)	CT2 Survey item code	Report period	1 QUANTITY PRODUCED FOR ALL PURPOSES (100% BASIS)	2 TOTAL SHIPMENTS INCLUDING TRANSFERS QUANTITY (100% BASIS)	3 TOTAL SHIPMENTS INCLUDING TRANSFERS VALUE-FOB PLANT ($1000)	4 QUANTITY PRODUCED AND CONSUMED IN PLANT (100% BASIS)	5	6
2813210-ACETYLENE: PRODUCED FOR PIPELINE SHIPMENT (EXCLUDE THAT SHIPPED TO BE COMPRESSED)- 1000 CU FT	2104	1972				XXXX		
		1971						
		1970						
2813210-ACETYLENE: PRODUCED FOR COMPRESSION, INCLUDING CYLINDER AND PIPELINE- 1000 CU FT	2106	1972	1971 and 1970 DATA			XXXX		
		1971	PREPRINTED ON FORM					
		1970						
2813210-ACETYLENE: PRODUCED FOR CONSUMPTION IN THIS PLANT- 1000 CU FT	2109	1972		XXXX	XXXX			
		1971						
		1970						
2813311-CARBON DIOXIDE: LIQUID OR GAS (EXCLUDE AMOUNTS CONVERTED TO SOLID) - SHORT TON	3130	1972						
		1971						

2813431-CARBON DIOXIDE: SOLID (DRY ICE)- SHORT TONS	3140	1972						CX-300-A-1
		1971						
		1970						
2813411-OXYGEN, CRUDE (TOTAL) 100% CU FT	4101	1972						
		1971						
		1970						
2813413-OXYGEN, HIGH PURITY: PRODUCED FOR CYLINDER AND BULK DELIVERY SHIPMENT- 100% CU FT	4103	1972				XXXX		
		1971						
		1970						
2813413-OXYGEN, HIGH PURITY: PRODUCED FOR PIP-LINE SHIPMENT- 1000 CU FT	4104	1972				XXXX		
		1971						
		1970						
2813413-OXYGEN, HIGH PURITY: PRODUCED FOR CONSUMPTION IN THIS PLANT- 1000 CU FT	4109	1972		XXXX	XXXX			
		1971						
		1970						
2813421-NITROGEN, INCLUDING LOWER PURITY: PRODUCED FOR CYLINDER AND BULK DELIVERY SHIPMENT- 1000 CU FT	4203	1972				XXXX		
		1971						
		1970						
2813421-NITROGEN, INCLUDING LOWER PURITY: PRODUCED FOR PIPELINE SHIPMENT- 1000 CU FT	4204	1972				XXXX		
		1971						
		1970						
2813421-NITROGEN, INCLUDING LOWER PURITY: LIQUID PRODUCED FOR GOVERNMENT USE - 100% CU FT	4207	1972				XXXX		
		1971						
		1970						
2813421-NITROGEN, INCLUDING LOWER PURITY: LIQUID PRODUCED FOR CONVERSION TO GAS 100% CU FT	4208	1972				XXXX		
		1971						
		1970						
2813421-NITROGEN, INCLUDING LOWER PURITY: PRODUCED FOR CONSUMPTION IN THIS PLANT - 100% CU FT	4209	1972		XXXX	XXXX			
		1971						
		1970						
2813443-NITROGEN, INC LWR PURITY: GAS(EXC ARTS LIQUEFIED & RPT AS LIQ):-PROD FOR CYL & BULK DEL SHPT- 1000 CU FT	4313	1972				XXXX		
		1971						
		1970						

A 4882

Continuation sheets are included, if all of your items could not be listed on this page.
If additional space is needed, use reverse side of page 1.

* Figures not received when form was prepared. PLEASE ENTER, if not previously submitted.

PART IA | **ADDITIONAL ITEMS OF THIS ESTABLISHMENT**
(Use this part if you do not have enough space in part 1.)

CX-300-B

Item (SIC product code – Description)	Survey item code	Report period	1	2	3	4	5	6

If continuation sheets have been enclosed, complete parts II, III, and IV below only on first sheet.

CX-300-B-1

PART II Has there been any change in the ownership or operation of this establishment during this period?

☐ Yes – *Indicate type of change below.* ☐ No

	Name of company	Address *(Number and street, city, State, ZIP code)*	Date of change
A. ☐ Purchased from			
B. ☐ Sold to			

C. ☐ Plant discontinued all operations — Date

D. ☐ Plant operations no longer covered by this survey *(Describe in "Remarks" the products currently produced.)*

E. ☐ Reorganized *(Describe in "Remarks," e.g., partnership change or change in corporate status.)*

4881

PART III Do the figures shown on this report and on your last report cover the identical establishments?

☐ Yes ☐ No – *Indicate reasons for difference in "Remarks."*

PART IV Remarks

PART V **CERTIFICATION – This report is substantially accurate and has been prepared in accordance with instructions.**

Signature of authorized official	Title and organization	Date

NOTE: The industry totals compiled from data on this form will be published by the Bureau of the Census in Current Industrial Reports as soon as possible after the necessary reports are received. Copies are available upon request to the Bureau of the Census.

A4885

REPORT FOR CALENDAR YEAR 1972

FORM MA28E.2

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

CURRENT INDUSTRIAL REPORTS

ANNUAL REPORT ON SHIPMENTS AND PRODUCTION OF INDUSTRIAL GASES

UNDER JOINT SPONSORSHIP WITH BUREAU OF DOMESTIC COMMERCE

RESPONSE TO THIS INQUIRY IS REQUIRED BY LAW

Your report to the Census Bureau is confidential by law (Title 13, U.S. Code). The law also provides that copies retained in your files are immune from legal process. See Instruction Manual for specific provisions relating to this survey.

In correspondence pertaining to this report please refer to the file number above your name. CX-300-C

2815
0340CB 3 10 6 00 0002
WELDERS SUPPLY, INC.

CONTINUATION SHEET NO 1

(Please correct any error in name and address including ZIP code)

INSTRUCTIONS – Please refer to Instruction Manual before filing this form. Complete and return this form in the envelope provided.

TO: Bureau of the Census, Jeffersonville Census Operations Division, Jeffersonville, Indiana 47130

EMPLOYER IDENTIFICATION NUMBER *Enter if not shown* → Identification Number used on Employer's Quarterly Federal Tax Return (U.S. Treasury Department Form 941).

340603810 *(Correct number if wrong)*

Person to be contacted *(Name – Enter if not shown – Correct if wrong)* →

Area code and telephone No. *(Enter if not shown – Correct if wrong)* → Area code | Number

PART I FOR EACH ITEM LISTED BELOW, ENTER FIGURES OR "NONE" for current period. *(The figures shown in the shaded areas were reported for the previous two periods.)*

Item (SIC product code – Description)	CT2 Survey item code	Report period	1 QUANTITY PRODUCED FOR ALL PURPOSES (100% BASIS)	2 TOTAL SHIPMENTS INCLUDING TRANSFERS QUANTITY (100% BASIS)	3 TOTAL SHIPMENTS INCLUDING TRANSFERS VALUE-FOB PLANT ($1000)	4 QUANTITY PRODUCED AND CONSUMED IN PLANT (100% BASIS)	5	6
2813440-NITROGEN, INC LWR PURITY: GAS(EXC AMTS LIQUEFIED & RPT AS LIQ):-PRODUCED FOR PIPELINE SHPT - 1000 CU FT	4314	1972				XXXX		
		1971						
		1970						
2813440-NITROGEN, INC LWR PURITY: GAS (EXCL AMTS LIQUEFIED):-PROD FOR CONSUMPTION IN THIS PLANT- 1000 CU FT	4319	1972		XXXX	XXXX			
		1971						
		1970						
2813440-NITROGEN, INCL. LOWER PURITY: LIQUID:- PRODUCED FOR CYLINDER AND BULK DELIVERY SHIPMENT- 1000 CU FT	4323	1972				XXXX		
		1971						
		1970						
2813440-NITROGEN, INC. LWR. PURITY: LIQUID:- PROD FOR BULK SHPT TO PIPELINES OTHER AIR SEPARATION PLTS - 1000 CU FT	4325	1972				XXXX		
		1971						

SEPARATING PLTS- 1000 CU FT		1970						
2813440-NITROGEN, INCL. LOWER PURITY: LIQUID:- PRODUCED FOR CONSUMPTION IN THIS PLANT - 1000 CU FT	4329	1972		XXXX	XXXX			
		1971						
		1970						
2813450-OXYGEN, INCL.LWR.PURITY: GAS(EXC AMTS LIQUEFIED & RPT AS LIQUID):-FOR CYL & BULK DEL SHPT - 1000 CU.FT	4413	1972				XXXX		
		1971						
		1970						
2813450-OXYGEN, INCL LWR PURI GAS (EXCLUDE AMTS LIQUEFIED & RPT AS LIQUID):-PROD FOR PIPELINE SHPT - 1000 CU FT	4414	1972				XXXX		
		1971						
		1970						
2813450-OXYGEN, INCL LWR PURI GAS (EXC AMTS LIQUEFIED AND RPT AS LIQ): PROD FOR CONSUMPTION IN THIS PLT- 1000 CU FT	4419	1972		XXXX	XXXX			
		1971						
		1970						
2813450-OXYGEN, INCL LWR PURI LIQUID: PROD FOR CYL & BULK DEL SHPT (EXC TO PIPELINES & AIR SEP PLTS - 1000 CU.FT	4423	1972				XXXX		
		1971						
		1970						
2813450-OXYGEN, INCL.LWR.PURI LIQUID:- PROD FOR BULK SHPT TO PIPELINES OR TO OTHER AIR SEP PLTS - 1000 CU FT	4425	1972				XXXX		
		1971						
		1970						
2813450-OXYGEN, INCL. LOWER PURITY: LIQUID:- PRODUCED FOR CONSUMPTION IN THIS PLANT - 1000 CU FT	4429	1972		XXXX	XXXX			
		1971						
		1970						
2813490-OTHER ELEMENTAL GASES - VALUE ONLY	4513	1972	XXXX	XXXX		XXXX		
		1971						
		1970						
2813471-NITROUS OXIDE- 1000 GAL STP	4613	1972						
		1971						
		1970						
2813492-OTHER COMPRESSED AND LIQUEFIED GASES- VALUE ONLY	4713	1972	XXXX	XXXX		XXXX		
		1971						
		1970						

CX-300-C-1

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Continuation sheets are included, if all of your items could not be listed on this page.
If additional space is needed, use reverse side of page 1.

* Figures not received when form was prepared.
PLEASE ENTER, if not previously submitted.

PART 1A ADDITIONAL ITEMS OF THIS ESTABLISHMENT
(Use this part if you do not have enough space in part 1.)

Item (SIC product code – Description)	Survey item code	Report period	1	2	3	4	5	6

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◊ *If continuation sheets have been enclosed, complete parts II, III, and IV below only on first sheet.*

PART II Has there been any change in the ownership or operation of this establishment during this period? CX-300-D-1

☐ Yes – *Indicate type of change below.* ☐ No

	Name of company	Address *(Number and street, city, State, ZIP code)*	Date of change
A. ☐ Purchased from			
B. ☐ Sold to			

C. ☐ Plant discontinued all operations — Date

D. ☐ Plant operations no longer covered by this survey *(Describe in "Remarks" the products currently produced.)*

E. ☐ Reorganized *(Describe in "Remarks," e.g., partnership change or change in corporate status.)*

PART III Do the figures shown on this report and on your last report cover the identical establishments?

☐ Yes ☐ No – *Indicate reasons for difference in "Remarks."*

PART IV Remarks

PART V **CERTIFICATION** – This report is substantially accurate and has been prepared in accordance with instructions.

Signature of authorized official	Title and organization	Date

NOTE: The industry totals compiled from data on this form will be published by the Bureau of the Census in Current Industrial Reports as soon as possible after the necessary reports are received. Copies are available upon request to the Bureau of the Census.

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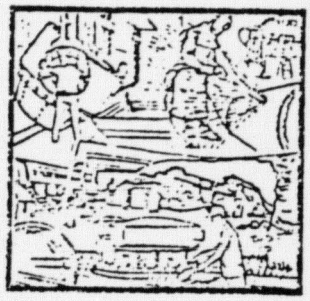
CX-312A

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

CURRENT INDUSTRIAL REPORTS



Industrial Gases

1972

U. S. DEPARTMENT OF COMMERCE • Social and Economic Statistics Administration • BUREAU OF THE CENSUS

July 1973

SERIES: M28C(72)-14

Shipments of industrial gases by primary manufacturers in 1972 totaled $544 million, or about 2 percent less than the 1971 figure of $609 million. The 1972 total is composed of $95 million for acetylene; $39 million for carbon dioxide; and $465 million for the product grouping elemental gases and other industrial gases, n.e.c. Compared with 1971, the 1972 totals showed a 9 percent decrease for acetylene, an increase of 1 percent for carbon dioxide, and a decrease of 1 percent for other elemental gases.

Figures in this report exclude values for hydrocarbon gases, such as propane, butane and propylene, or halogenated hydrocarbons and cyclopropane, which are reported to the United States Tariff Commission, and for sulfur dioxide and chlorine, which are shown in the Current Industrial Reports, Series M28A(72)-14, Inorganic Chemicals and Gases.

The shipments values for some of the gases, particularly oxygen, reported by companies vary widely not only because of the conditions of sales, including delivery by pipeline or cylinder, but also because plant operations differ. The manufacturing and selling activities of some companies are centralized at the primary production site, while other companies sell or ship liquefied gases to other sites (filling stations or conversion units) where the products are changed in form, "packaged," and sold. The values reported for some sites thus include marketing activities and for other sites do not.

Figures showing the quantities shipped to other plants of the same company (interplant transfers) were not compiled separately and thus are unavailable. In evaluating these interplant transfers for inclusion in the totals, respondents were instructed to report values which would approximate the commercial selling value, f.o.b. plant, and not the cost of production or some other book price.

Beginning in 1971, respondents were requested to report production either by specific methods of shipment or consumption in the producing plants for selected elemental gases and acetylene. Data for hydrogen, nitrogen and oxygen include lower purity and high purity gas. Prior to 1971, lower purity gas was collected separately. Statistics for crude argon are collected separately. Special reporting instructions are also provided for carbon dioxide producers so that the chemical produced and shipped is reported only once, either in solid or liquid (including gaseous) form. Statistics exclude such activities as the liquefaction of purchased nitrogen. The quantities reported as produced exclude any information for gases used as fuel in

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Inquiries concerning these figures should be addressed to the U.S. Department of Commerce, Bureau of the Census, Industry Division, Washington, D.C. 20233. This publication is for sale by the Bureau of the Census. Price: 15 cents per copy—$1.50 per year.

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producing plant, vented, or disposed of as waste. Other limitations of the statistics are indicated in footnotes appearing at the end of table 1.

In addition to the annual production statistics shown in table 1, monthly statistics for specified gases are shown in table 8. These monthly statistics supersede those which were released earlier in the monthly Current Industrial Reports, Series M25C, Industrial Gases, United States Production. Monthly and annual statistics have been issued beginning with January 1941. Geographic totals for specific gases are shown in tables 2 through 7. The geographic distribution of industrial gas plants by State is shown in table 9.

All figures included in this report are collected in thousand cubic feet, 70 F, at 1 atmosphere pressure, unless otherwise specified.

ACKNOWLEDGMENTS--This report was prepared in the Industry Division under the direction of Lonnie M. Conner, Chief for Chemicals, Wood Products, and Nonmetallic Minerals Branch. Doris W. Funk, Chief, Chemicals, assisted by John P. Govoni, was directly responsible for the review of the data and preparation of the report. Elmer S. Biles, Chief of the Division, provided overall direction and coordination to this project.

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EX-312C

Table 1.--ANNUAL PRODUCTION AND SHIPMENTS OF INDUSTRIAL GASES: 1968 TO 1972

Code	Product	Unit of measure	Year	Quantity produced for all purposes	Total shipments including transfers quantity	Total shipments including transfers value ($1,000)
2813---	Industrial gases, total		1972	(X)	(X)	r 549,771
			1971	(X)	(X)	r 1600,052
			1970	(X)	(X)	1633,602
			1969	(X)	(X)	1623,111
			1968	(X)	(X)	1607,521
2813200	Acetylene[2]	Mil.cu.ft.	1972	11,[illegible]	7,238	94,524
			1971	r12,319	r7,718	r102,532
			1970	14,831	8,926	99,482
			1969	15,918	9,372	98,542
			1968	15,671	8,151	89,025
	Produced for pipeline shipment excluding that shipped to be compressed	...do....	1972			
			1971			
	Produced for compression, including cylinder and pipeline	...do....	1972	r5,738	r5,736	r52,069
			1971	r6,185	r6,185	r58,343
	Produced for consumption in this plant	...do....	1972	r1,507	r1,502	r42,455
			1971	r1,515	r1,533	r44,219
			1972	4,323	(X)	(X)
			1971	4,613	(X)	(X)
	Carbon dioxide, total	Short tons	1972	r1,441,287	1,371,159	r39,159
			1971	r1,314,026	r1,235,112	r34,943
			1970	1,155,454	1,028,290	37,112
			1969	1,166,611	1,079,301	40,627
			1968	1,058,120	943,466	41,774
2813311	Liquid and gas	...do....	1972	r1,171,718	r1,054,808	r33,367
			1971	r1,027,397	920,575	r27,373
			1970	r811,910	710,743	19,487
			1969	r802,429	711,529	20,915
			1968	r681,014	575,915	22,491
2813431	Solid (dry ice)	...do....	1972	r305,569	305,651	15,792
			1971	r312,629	311,387	17,599
			1970	320,616	317,547	17,675
			1969	364,142	361,772	19,712
			1968	371,105	367,521	19,283
2813---	Elemental gases and other industrial gases, n.e.c., total	.....	1972	(X)	(X)	r485,001
			1971	(X)	(X)	r487,447
			1970	(X)	(X)	497,598
			1969	(X)	(X)	483,945
			1968	(X)	(X)	476,722
2813415	Argon, high purity, total	Mil.cu.ft.	1972	3,801	3,801	33,008
			1971	r3,018	r3,042	r29,136
			1970	2,712	2,711	39,139
			1969	2,597	2,596	38,650
			1968	2,114	2,113	33,162
	Produced for cylinder and bulk delivery shipment	...do....	1972	3,501	3,504	33,026
			1971	r3,018	r3,042	r29,136
	Helium[3]	...do....	1972	(NA)	(NA)	(NA)
			1971	4,563	437	(NA)
			1970	4,600	542	(NA)
			1969	4,662	670	(NA)
			1968	4,558	802	(NA)
2813420	Hydrogen, total	...do....	1972	558,809	17,052	30,303
			1971	555,881	r17,170	r31,709
			1970	559,651	20,940	33,530
			1969	564,821	25,436	34,151
			1968	201,752	28,255	37,922
	Produced for cylinder and bulk delivery shipment	...do....	1972	5,158	5,158	12,774
	Liquid produced for conversion to gas	...do....	1971	r5,301	r5,247	r19,492
	Produced for pipeline shipment	...do....	1972	12,931	12,494	10,549
	Liquid produced for government use	...do....	1971	r12,329	r12,173	r12,391
	Produced for consumption in this plant	...do....	1972	10,593	(X)	(X)
			1971	r24,047	(X)	(X)
2813410	Nitrogen, total[4]	...do....	1972	193,340	176,833	130,358
			1971	r168,040	r153,758	r124,117
			1970	131,191	134,025	123,032
			1969	132,691	118,305	118,633
			1968	118,731	105,370	111,777
	Produced for cylinder and bulk delivery shipment	...do....	1972	771	750	3,030
			1971	r635	r612	r2,332
	Produced for pipeline shipment	...do....	1972	114,230	112,139	30,309
			1971	r94,238	r95,620	r28,250
	Produced for consumption in this plant	...do....	1972	14,350	(X)	(X)
			1971	r13,977	(X)	(X)

See footnotes at end of table.

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Table 1.--ANNUAL PRODUCTION AND SHIPMENTS OF INDUSTRIAL GASES: 1968 TO 1972--Continued

[illegible]	[illegible]	Unit of measure	Year	Quantity produced for all purposes	Total shipments including interplant transfers: Quantity	Total shipments including interplant transfers: Value ($1,000)[1]
	Elemental gases and other industrial gases, n.e.c.--Continued					
	Nitrogen[6]--Continued					
	Liquid:					
	Produced for cylinder and bulk delivery shipment	Mil.cu.ft.[2]	1972	59,951	58,453	92,254
			1971	r53,163	r53,152	r93,377
	Produced for bulk shipment to pipelines or to other air separation plants	...do....	1972	5,095	5,091	1,675
			1971	4,319	r4,313	r4,298
	Produced for consumption in this plant	...do....	1972	1,531	(X)	(X)
			1971	r1,688	(X)	(X)
2813150	Oxygen, total[6]	...do....	1972	r333,190	r201,726	r216,793
			1971	r319,171	r268,552	r226,260
			1970	282,960	273,165	237,675
			1969	275,962	264,358	229,454
			1968	247,995	238,178	224,967
	Gas:					
	Produced for cylinder and bulk delivery shipment	...do....	1972	520	540	4,261
			1971	r499	r499	r4,250
	Produced for pipeline shipments	...do....	1972	216,963	246,598	119,203
			1971	r218,176	r218,167	r107,269
	Produced for consumption in this plant	...do....	1972	(9)	(X)	(X)
			1971	(9)	(X)	(X)
	Liquid:					
	Produced for cylinder and bulk delivery shipments	...do....	1972	43,943	43,943	81,209
			1971	r40,559	r40,559	r95,184
	Produced for bulk shipment to pipeline or to other air separation plants	...do....	1972	10,275	10,275	12,140
			1971	r9,637	r9,637	r19,147
	Produced for consumption in this plant	...do....	1972	r51,179	(X)	(X)
			1971	r50,300	(X)	(X)
2813171	Nitrous oxide	1,000 pals (est)	1972	1,278,285	1,278,285	4,569
			1971	1,121,566	1,121,566	4,167
			1970	1,048,553	1,048,553	3,840
			1969	1,032,712	1,031,919	3,917
			1968	966,638	966,566	3,547
2813198	Other industrial gases, n.e.c., including crude argon, carbon dioxide pressed, and transferred for further processing, and crude and high purity helium produced in privately owned plants[7]	.....	1972	(X)	(X)	50,051
			1971	(X)	(X)	r38,201
			1970	(X)	(X)	36,791
			1969	(X)	(X)	30,375
			1968	(X)	(X)	32,207

(NA) Not available. n.e.c. Not elsewhere classified. rRevised. (X) Not applicable.

[1]Excludes value for helium produced in government owned plants.
[2]Excludes information from refrigerated storage, shipping, welding shops, and small establishments using portable generators.
[3]Excludes production of liquid and solid carbon dioxide converted to and reported in dry ice and also amounts converted from pure carbon dioxide (liquid or solid) purchased or received from other plants. Also excludes quantities produced and consumed in plants manufacturing soda ash or urea, and quantities refined and transferred to other plants where it is further processed.
[4]Source: U.S. Department of Interior, Bureau of Mines.
[5]Excludes amounts vented, used as fuel, etc. Also includes amounts produced and consumed in the manufacture of synthetic ammonia and not sold. It includes an unspecified amount produced for sale or interplant transfer to plants consuming this gas in the production of ammonia. Also excludes amounts produced by the ammonia dissociation process 'cracking of ammonia'. Also excludes amounts produced in petroleum refineries for captive use. However, of the total shown for lower purity hydrogen prior to 1969, 70 to 75 percent was accounted for by petroleum refineries with captive hydrogen production. Not all such petroleum refineries were contacted in this survey.
[6]Excludes amounts produced and consumed in the manufacture of synthetic ammonia or ammonia derivatives.
[7]Data for 1972 and 1971 include figures for high and lower purity gas. Prior to 1971, data only included figures for high purity gas.
[8]Data for lower purity nitrogen and lower purity oxygen combined with code 2813299 for 1969 through 1970.
[9]Data for oxygen(gas), produced for consumption in this plant, combined with data for oxygen (liquid), produced for consumption in this plant, to avoid disclosing data for individual companies.
[10]Excludes hydrocarbon gases such as methane, butane, and propylene, or halogenated hydrocarbons and cyclopropane, which are reported to the U.S. Tariff Commission. Also excludes sulfur dioxide and chlorine, figures for which are shown in Current Industrial Reports Series M28A(72)-13, Inorganic Chemicals and Gases.

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Table 2.--PRODUCTION AND SHIPMENTS OF ACETYLENE, BY GEOGRAPHIC AREA: 1972

Geographic area	Production (mil. cu. ft.)	Total shipments including interplant transfers	
		Quantity (mil. cu. ft.)	Value ($1,000)
UNITED STATES, TOTAL[1]	11,569	7,238	94,521
Northeast Region and North Central Region	1,163	949	21,957
South Region	9,930	6,031	64,190
Mountain Division	97	77	2,196
Pacific Division	378	181	5,881

[1]See table 9 for the number of establishments reporting production by State.

Table 3.--PRODUCTION AND SHIPMENTS OF CARBON DIOXIDE, BY DIVISIONS: 1972

Division	Total liquid and solid			Liquid and gas			Solid (dry ice)		
	Production (short tons)	Shipments		Production (short tons)	Shipments		Production (short tons)	Shipments	
		Quantity (short tons)	Value ($1,000)		Quantity (short tons)	Value ($1,000)		Quantity (short tons)	Value ($1,000)
UNITED STATES, TOTAL[1]	1,481,287	1,371,459	39,159	1,171,748	1,064,808	23,367	306,539	306,651	15,792
New England and Middle Atlantic	95,934	93,830	3,037	58,951	56,816	1,041	37,553	37,521	1,996
East North Central	241,751	267,115	8,373	213,[illegible]	196,[illegible]	4,215	70,770	70,770	4,158
West North Central	260,572	252,719	6,558	242,[illegible]	215,[illegible]	4,186	38,183	38,183	2,022
South Atlantic and East South Central	241,[illegible]	251,[illegible]	9,[illegible]	232,191	202,[illegible]	6,629	49,110	49,410	3, 11
West South Central	335,339	339,[illegible]	5,641	279,723	229,[illegible]	4,713	20,[illegible]	20,610	1,178
Mountain	37,715	37,715	1,230	26,[illegible]	26,[illegible]	376	31,319	31,319	931
Pacific	268,304	107,303	4,330	145,[illegible]	134,[illegible]	1,807	58,505	58,505	2,503

[1]See table 9 for the number of establishments reporting production by State.

Table 4.--SHIPMENTS OF ARGON (HIGH PURITY) BY GEOGRAPHIC AREA: 1972

Geographic area	Total shipments including interplant transfers	
	Quantity (mil. cu. ft.)	Value ($1,000)
UNITED STATES, TOTAL	3,804	33,098
North East Region	855	6,610
East North Central Division	1,373	11,670
Ohio	464	3,964
South Atlantic Division	521	5,[illegible]
East South Central Division	101	1,212
West South Central Division	112	3,[illegible]
West Region	840	1,741
California	439	3,518

[1]See table 4 for the number of establishments reporting production by State.

Table 5.--PRODUCTION AND SHIPMENTS OF HYDROGEN (TOTAL) BY GEOGRAPHIC AREA: 1972

Geographic area	Production (mil. cu. ft.)	Total shipments including interplant transfers	
		Quantity (mil. cu. ft.)	Value ($1,000)
UNITED STATES, TOTAL[1]	58,890	17,952	30,323
Northeast Region	4,971	2,453	7,092
North Central Region	5,632	2,261	4,583
South Region and West Region	48,287	13,238	18,638
East South Central Division	5,070	1,715	1,444
West South Central Division	30,094	3,343	7,810

[1]See table 9 for the number of establishments reporting production by State.

Table 6.--PRODUCTION AND SHIPMENTS OF NITROGEN (TOTAL) BY GEOGRAPHIC AREA: 1972

Geographic area	Production (mil. cu. ft.)	Total shipments including interplant transfers	
		Quantity (mil. cu. ft.)	Value ($1,000)
UNITED STATES, TOTAL[1]	193,540	176,833	130,358
New England Division	3,141	3,104	3,537
Middle Atlantic Division	23,721	22,566	22,732
New York	3,576	3,193	3,093
New Jersey	8,563	8,519	10,637
Pennsylvania	11,582	10,854	9,043
North Central Region	39,422	37,869	31,515
Ohio	11,320	10,901	9,695
Illinois	8,503	8,252	8,816
South Atlantic Division	30,242	25,843	16,598
West Virginia	11,973	7,601	3,732
East South Central Division	12,251	10,182	9,217
Tennessee	4,718	3,156	2,286
Alabama	4,804	4,804	5,740
West South Central Division	62,323	55,670	22,864
Texas	50,107	45,839	17,195
Mountain Division	1,768	1,768	2,353
Utah	245	245	441
Pacific Division	20,672	19,831	21,402
California	19,117	18,036	19,210

[1]See table 9 for the number of establishments reporting production by State.

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CX-312G

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Table 7.—[illegible] PRODUCTION AND SHIPMENTS OF OXYGEN (TOTAL BY GEOGRAPHIC AREAS: 1971

[illegible] graphic area	Production (mil. cu. ft.)	Total shipments including interplant transfers: Quantity (mil. cu. ft.)	Total shipments including interplant transfers: Value ($1,000)
UNITED STATES, TOTAL[1]	353,190	301,756	216,763
New England Division	1,117	1,105	2,071
Middle Atlantic Division	67,174	66,483	45,946
New York	12,132	12,075	8,049
New Jersey	2,907	2,910	5,550
Pennsylvania	52,099	51,500	31,968
North Central Region	127,251	111,528	72,940
Ohio	38,942	38,977	21,991
Michigan	19,141	10,650	6,341
South Atlantic Region	33,995	33,792	21,984
West Virginia	20,286	19,269	12,152
Florida	1,203	1,203	1,842
East South Central Division	23,260	23,157	22,060
Alabama	8,737	8,736	8,367
West South Central Division	75,230	42,738	25,297
Texas	56,335	35,291	10,506
Mountain Division	7,102	6,735	6,087
Utah	3,488	3,122	2,356
Pacific Division	16,187	16,186	17,415
California	11,348	11,648	11,979

[1] See [illegible] for number of establishments reporting production by State.

Table 8.--PRODUCTION OF SPECIFIED INDUSTRIAL GASES, BY MONTHS: 1972 AND 1971

Code	Product	Unit of measure	Year	Total	January	February	March	April	May	June	July	August	September	October	November	December
2813203	Acetylene	mil.cu.ft.	1972	11,586	1,071	1,005	1,005	925	868	969	933	961	912	984	922	993
			1971	r12,349	957	1,010	831	1,084	1,052	1,025	1,020	1,036	1,019	1,086	1,115	1,048
	Produced for pipeline shipment, excluding that produced to be compressed	do.	1972	5,738	503	491	492	458	440	497	479	491	436	477	475	499
			1971	r6,185	436	474	361	523	551	500	515	530	506	568	547	556
	Produced for compression, including cylinder and pipeline	do.	1972	1,567	135	136	141	121	127	121	103	120	116	135	130	125
			1971	r1,515	127	132	144	131	121	122	111	116	122	127	121	170
	Produced for consumption in this plant	do.	1972	4,321	400	378	372	346	301	351	350	350	360	372	372	369
			1971	4,019	394	373	326	341	377	405	391	390	391	354	351	315
2813113	Argon, high purity, total	do.	1972	3,401	282	272	316	286	328	329	318	301	318	352	354	345
			1971	r3,018	228	228	267	241	246	233	254	228	259	289	276	289
	Produced for cylinder and bulk delivery shipment	do.	1972	3,401	282	272	316	286	328	329	318	301	318	352	354	345
			1971	r3,018	228	228	267	241	246	233	254	228	259	289	276	289
	Carbon dioxide, total	Short tons	1972	1,181,287	104,612	96,533	102,307	118,068	134,222	138,481	132,550	139,988	132,118	127,760	118,913	105,836
			1971	r1,144,026	96,736	r98,263	102,101	111,235	110,184	119,018	125,206	126,771	118,503	114,759	110,344	102,736
2813311	Liquid and gas	do.	1972	1,174,788	85,167	74,678	107,012	92,331	105,633	108,792	101,775	109,330	102,975	101,385	97,917	86,637
			1971	r1,027,327	77,257	79,073	80,511	83,389	84,905	89,035	92,080	92,631	84,906	86,020	83,510	84,941
2813301	Solid (dry ice)	do.	1972	306,529	19,145	21,855	25,737	24,503	29,659	30,775	30,558	28,273	28,401	20,9	19,059	
			1971	r316,699	19,519	19,212	21,863	25,416	27,579	29,963	33,206	34,137	29,687	28,139	21,7	22,705
2813129	Hydrogen, total	mil.cu.ft.	1972	58,850	4,791	4,804	4,972	4,751	5,116	4,887	4,849	4,686	4,973	5,040	1,9	4,981
			1971	r55,081	4,421	4,221	4,701	4,638	4,698	4,633	4,960	4,689	4,382	5,179	4,6	4,781
	Produced for cylinder and bulk delivery shipment	do.	1972	5,163	454	432	505	383	504	486	470	454	453	462	501	359
	Liquid produced for conversion to gas	do.	1971	r5,304	411	404	459	496	487	485	414	450	393	442	402	417
	Produced for pipeline shipment	do.	1972	12,834	1,015	996	1,161	998	1,186	1,018	979	1,008	1,159	1,088	1,015	1,148
	Liquid produced for government use	do.	1971	r12,330	1,054	938	1,184	1,021	1,121	1,001	1,008	1,004	749	1,279	932	1,015
	Produced for consumption in this plant	do.	1972	40,593	3,322	3,376	3,303	3,360	3,428	3,383	3,500	3,224	3,361	3,493	3,1	3,174
			1971	r34,047	2,953	2,879	3,058	3,119	3,090	3,164	3,237	3,235	3,211	3,455	3,2	3,349
2813410	Nitrogen, total	do.	1972	193,540	15,118	14,804	15,898	14,970	15,938	15,994	16,411	16,607	16,302	17,260	16,8	17,316
			1971	r168,010	13,591	12,957	14,469	13,738	14,407	14,134	13,891	13,729	12,711	14,650	14,1	14,537
	Gas: Produced for cylinder and bulk delivery shipment	do.	1972	771	49	66	72	73	75	73	59	59	48	59	69	69
			1971	r635	42	62	59	65	58	59	52	33	28	53	57	67
	Produced for pipeline shipment	do.	1972	112,239	9,005	8,530	9,210	8,706	9,189	9,150	9,311	9,610	9,421	9,941	9,8	10,168
			1971	r91,238	7,907	7,521	8,226	7,974	8,140	8,007	7,026	7,370	7,453	7,817	7,6	8,317
	Produced for consumption in this plant	do.	1972	14,950	1,110	1,243	1,452	1,135	1,210	1,184	1,239	1,290	1,210	1,333	1,3	1,428
			1971	r13,977	1,212	1,076	1,254	1,010	1,182	1,149	1,156	1,204	1,122	1,201	1,1	1,174

A 48616

CX-31214

TABLE [illegible]—PRODUCTION OF SELECTED INDUSTRIAL GASES IN THE U.S. IN CUBIC FEET: 1970 AND 1971—Continued

Code	Product	Unit of measure	Year	Total	January	February	March	April	May	June	July	August	September	October	November	December
	Nitrogen—Continued															
	Liquid:															
	Produced for cylinder and bulk delivery shipment	Mil. cu. ft.	1972	58,923	5,013	5,042	4,777	4,151	4,819	5,033	5,285	5,116	5,139	3,378	5,011	5,064
			1971	33,183	2,677	2,841	2,426	2,191	2,569	4,416	4,603	4,601	1,630	5,029	4,533	4,396
	Produced for bulk shipment to pipelines or to other air separation plants	do	1972	5,005	39	311	392	333	380	411	382	459	362	122	11	109
			1971	r1,314	117	175	117	85	103	312	315	361	189	6	1	1
	Produced for consumption in this plant	do	1972	1,598	95	120	110	107	127	163	135	133	121	121	133	133
			1971	1,188	109	102	107	114	105	161	112	140	114	161	167	173
28131-0	Oxygen, total	do	1972	153,190	27,142	26,530	25,771	24,879	25,055	25,264	25,014	25,064	25,249	17,736	20,012	17,363
			1971	119,171	24,224	23,088	20,677	24,048	25,062	26,714	26,108	21,603	23,733	25,237	24,809	20,242
	Gas:															
	Produced for cylinder and bulk delivery shipment	do	1972	530	41	38	10	44	41	41	36	40	36	64	55	51
			1971	r389	21	27	41	18	16	41	48	38	16	43	53	42
	Produced for pipeline shipment	do	1972	216,265	19,223	18,305	19,650	20,345	21,162	20,309	20,139	20,822	20,522	22,205	21,611	22,447
			1971	r218,176	19,654	18,915	21,241	19,274	20,748	18,515	18,170	13,598	15,458	17,029	16,815	17,575
	Produced for consumption in this plant	do	1972	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
			1971	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	Liquid:															
	Produced for cylinder and bulk delivery shipment	do	1972	43,013	3,218	3,340	3,528	3,120	3,771	3,555	3,400	3,403	3,039	4,426	3,960	4,200
			1971	r40,559	3,128	3,063	3,708	3,181	3,450	3,287	3,406	3,126	3,118	3,752	3,321	3,332
	Produced for bulk shipment to pipelines or to other air separation plants	do	1972	10,274	650	821	991	928	819	855	891	901	863	730	811	829
			1971	r9,607	995	1,000	1,014	993	929	990	670	567	884	543	550	506
	Produced for consumption in this plant	do	1972	r51,179	4,241	4,177	4,181	4,292	4,259	4,473	4,248	3,895	4,209	4,312	4,455	4,525
			1971	r50,300	4,721	4,157	5,777	4,157	4,189	4,111	4,104	4,276	4,127	3,970	4,007	4,167

r Revised

[1] Data for oxygen (gas), produced for consumption in this plant, combined with data for oxygen (liquid), produced for consumption in this plant, to avoid disclosing figures for individual companies.

A 48817

A 4898

EX-312

10

Table [illegible]. NUMBER OF ESTABLISHMENTS REPORTING THE PRODUCTION OF SELECTED INDUSTRIAL GASES, BY STATE: 1972

State	Acetylene	Carbon dioxide			Argon (refined)	Hydrogen	Nitrogen	Oxygen	Nitrous oxide
	2813200	Total[1] 28133	Liquid or gas[2] 2813311	Solid 2813331	2813415	2813420	2813440	2813450	2813471
[illegible]	206	59	45	31	52	122	139	117	4
New England	6	1	-	1	1	3	6	5	-
Maine	-	-	-	-	-	1	-	1	-
New Hampshire	-	-	-	-	-	-	-	-	-
Vermont	-	-	-	-	-	-	1	-	-
Massachusetts	3	1	-	1	1	1	4	3	-
Rhode Island	1	-	-	-	-	1	-	-	-
Connecticut	2	-	-	-	-	1	-	1	-
Middle Atlantic	29	4	2	2	6	15	14	16	-
New York	6	2	2	-	1	4	5	4	-
New Jersey	4	1	0	1	2	8	6	5	-
Pennsylvania	19	1	-	1	3	3	3	7	-
East North Central	37	6	4	1	14	28	29	23	1
Ohio	11	3	2	3	6	7	6	7	1
Indiana	6	1	1	-	2	3	3	3	-
Illinois	5	1	-	1	3	12	12	7	-
Michigan	8	-	-	-	3	6	6	7	-
Wisconsin	4	1	1	-	-	-	2	1	-
West North Central	17	10	8	5	-	4	7	6	1
Minnesota	3	2	1	1	-	-	1	2	-
Iowa	3	4	4	2	-	-	-	-	-
Missouri	2	2	1	1	-	2	3	2	1
North Dakota	-	-	-	-	-	-	-	-	-
South Dakota	3	-	-	-	-	-	1	2	-
Nebraska	1	-	-	-	-	1	-	-	-
Kansas	5	2	2	1	-	1	2	-	-
South Atlantic	27	7	6	4	8	15	23	16	1
Delaware	-	-	-	-	1	4	2	2	-
Maryland	2	-	-	-	1	-	3	2	-
District of Columbia	-	-	-	-	-	-	-	-	-
Virginia	4	1	1	1	1	2	3	2	1
West Virginia	4	1	1	1	2	5	5	5	-
North Carolina	4	1	1	-	1	1	3	1	-
South Carolina	1	-	-	-	-	-	3	1	-
Georgia	4	1	1	1	1	2	2	1	-
Florida	8	3	2	1	1	1	2	2	-
East South Central	15	3	3	1	4	16	17	12	-
Kentucky	2	1	1	-	-	1	5	3	-
Tennessee	8	2	2	1	2	9	7	4	-
Alabama	4	-	-	-	2	3	4	4	-
Mississippi	1	-	-	-	-	3	1	1	-
West South Central	40	11	10	4	9	24	19	17	-
Arkansas	2	-	-	-	1	-	1	1	-
Louisiana	8	4	3	2	2	6	4	6	-
Oklahoma	3	-	-	-	-	1	-	-	-
Texas	30	7	7	2	5	17	11	10	-
Mountain	14	6	4	6	2	2	4	4	-
Montana	3	-	-	-	-	-	1	1	-
Idaho	2	-	-	-	-	-	-	-	-
Wyoming	1	-	-	-	-	-	-	-	-
Colorado	5	2	1	2	1	1	2	2	-
New Mexico	2	3	2	2	-	-	-	-	-
Arizona	1	-	-	-	-	1	2	2	-
Utah	3	2	1	2	1	1	3	3	-
Nevada	1	-	-	-	-	-	-	-	-
Pacific	23	11	9	7	8	15	15	12	1
Washington	5	2	2	2	1	2	3	2	-
Oregon	1	-	-	-	1	1	1	1	-
California	11	6	4	4	5	12	9	7	1
Alaska	1	-	-	-	-	-	-	-	-
Hawaii	2	3	3	1	-	2	2	2	-

- Represents zero.
[1] Unpublishable.
[2] Excludes plants converting entire production to solid.

CX-312K

A4899

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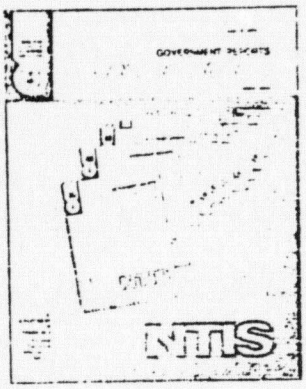

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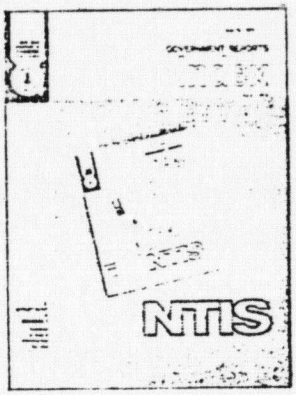

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Organization _____

Address _____

City, State, ZIP _____

Field of Interest _____

_____

_____

Signed _____

A 4900 CX-335-4

As filed with the Securities and Exchange Commission on October 29, 1973.

Registration No. 2-47443

PRE-EFFECTIVE AMENDMENT

SECURITIES AND EXCHANGE COMMISSION

Washington, D. C. 20549

SECURITIES AND EXCHANGE COMMISSION
RECEIVED
OCT 29 1973
OFFICE OF
REGISTRATIONS & REPORTS

AMENDMENT No. 4

To

Form S-1

REGISTRATION STATEMENT

Under

THE SECURITIES ACT OF 1933

Liquid Air Corporation of North America

(Exact name of registrant as specified in charter)

405 LEXINGTON AVENUE

NEW YORK, NEW YORK 10017

(Address of principal executive offices)

A4901

CX 35-B

LIQUID AIR CORPORATION OF NORTH AMERICA

CROSS REFERENCE SHEET

Pursuant to Rule 404(c) showing the location in the Prospectus of the answers to the Items of Part I of Form S-1.

Item	Item Caption	Location in Prospectus
1.	Distribution Spread	Cover Page
2.	Plan of Distribution	Cover Page; Underwriting
3.	Use of Proceeds to Registrant	Use of Proceeds
4.	Sales Otherwise than for Cash	*
5.	Capital Structure	Capitalization
6.	Summary of Earnings	Consolidated Statements of Earnings
7.	Organization of Registrant	The Company
8.	Parents of Registrant	Principal Stockholders
9.	Description of Business	The Company; Business
10.	Description of Property	Business
11.	Organization Within Five Years	The Company
12.	Pending Legal Proceedings	*
13.	Capital Stock Being Registered	Description of Capital Stock
14.	Long-Term Debt Being Registered	*
15.	Other Securities Being Registered	*
16.	Directors and Executive Officers	Management
17.	Remuneration of Directors and Officers	Management
18.	Options to Purchase Securities	*
19.	Principal Holders of Securities	Principal Stockholders; Selling Stockholders
20.	Interest of Management and Others in Certain Transactions	Certain Transactions
21.	Financial Statements	Financial Statements

* Item is omitted because answer is negative or item is inapplicable.

A 4902

CX-335-C

EXPLANATORY NOTE

There is included herein the Prospectus in the form to be used in connection with the offering in the United States. Hereafter are certain pages which will appear in the Prospectus to be used in connection with the offering in Canada. Such pages will be substituted, as appropriate, for the corresponding pages in the complete Prospectus included herein or added to such Prospectus. Twenty-five copies of each form of Prospectus (except those varying only in respect to the insertion of the names of Canadian dealers) used after the effective date of this Registration Statement will be filed with the Commission pursuant to Rule 424(b) in the exact form in which it was used.

A 4903

CX-335-D

No.

No securities commission or similar authority in Canada has in any way passed upon the merits of the securities offered hereunder and any representation to the contrary is an offense.

736,333 Shares

Liquid Air Corporation of North America

Common Stock

Of the shares of Common Stock being offered for sale, 70,000 are being offered in Canada by Canadian Underwriters. Of the total shares offered, 175,000 are being sold by the Company and 561,333 are being sold by stockholders as stated herein under "Selling Stockholders." The Company will not receive directly any of the proceeds of the sale of the shares to be sold by the Selling Stockholders (see "Certain Transactions").

Prior to this offering there has been no public market for the Company's Common Stock. It is currently estimated that the initial public offering price in the United States may range from $24 to $26. The offering price in Canada will reflect translation of the U. S. offering price into Canadian dollars on the basis of exchange rates in effect at the time of the offering.

THESE SECURITIES HAVE NOT BEEN APPROVED OR DISAPPROVED BY THE SECURITIES AND EXCHANGE COMMISSION NOR HAS THE COMMISSION PASSED UPON THE ACCURACY OR ADEQUACY OF THIS PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

	Initial Public Offering Price	Underwriting Discount	Proceeds to Company(2)(3)	Proceeds to Selling Stockholders(2)(3)
Per share offered in Canada(1)	Cdn. $	Cdn. $	Cdn. $	Cdn. $
Per share offered in the United States(1)	$	$	$	$
Total(1)	$	$	$	$

(1) All dollar figures used herein, unless otherwise indicated, are stated in U.S. dollars. The offering price in Canada reflects translation of U.S. dollars into Canadian dollars, rounded to the nearest $.01 at a currency exchange rate of Cdn. $1.00 = $ U.S. as quoted in New York City on , 1973.

(2) Before deducting expenses estimated at Cdn. $ payable by the Company and Cdn. $ payable by the Selling Stockholders.

(3) The proceeds to the Company and to the Selling Stockholders are to be paid by the Underwriters in U.S. dollars.

These shares are conditionally offered severally by the Underwriters, as specified herein, subject to receipt and acceptance by them and subject to the right to reject any order in whole or in part. It is expected that stock certificates for the shares will be ready for delivery on November , 1973.

The date of this Prospectus is , 1973.

CANADIAN

A 4904

CX-335-E

No person has been authorized to give any information or to make any representation not contained in this prospectus and, if given or made, such information or representation must not be relied upon as having been authorized. This prospectus does not constitute an offering of any securities other than the registered securities to which it relates or an offer to any person in any State of the United States or Province of Canada where such offer would be unlawful. The delivery of this prospectus at any time does not imply that information herein is correct as of any time subsequent to its date.

Until , 1974 (90 days after date of this prospectus) all dealers effecting transactions in the registered securities, whether or not participating in this distribution, may be required to deliver a prospectus. This is in addition to the obligation of dealers to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.

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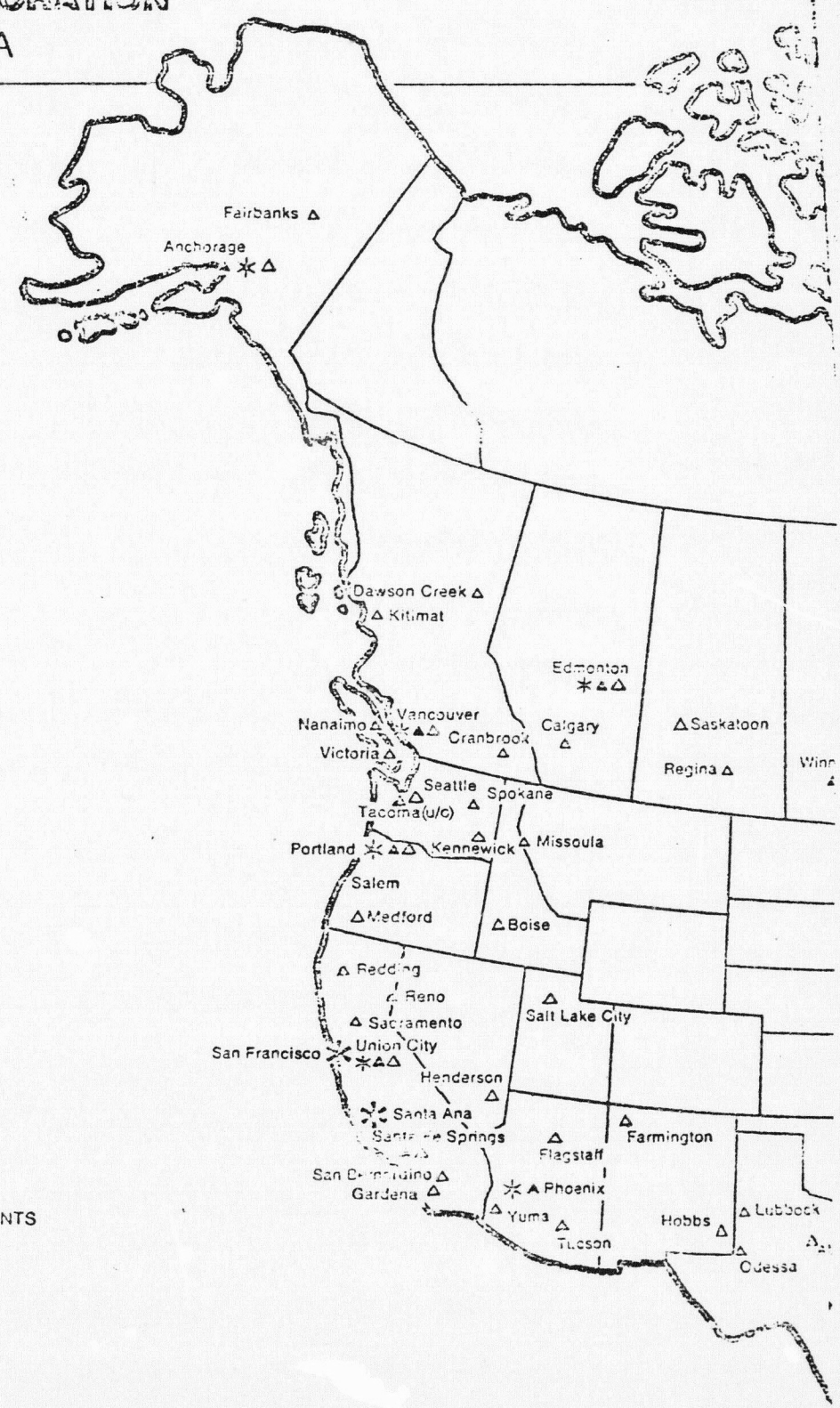
financial statements included herein are stated in United States dollars. Application rency exchange rate of $1.00 Cdn. = $ U.S. to these financial statements would t in a significant difference.

ONNECTION WITH THIS OFFERING, THE UNDERWRITERS MAY OVER- OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE F PRICE OF THE COMMON STOCK OF THE COMPANY AT A LEVEL THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. ABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME.

A 4905

CX-335-F

LIQUID AIR CORPORATION
OF NORTH AMERICA



KEY

- CORPORATE HEADQUARTERS
- CORPORATE OFFICES
- REGIONAL OFFICES
- PRINCIPAL AIR SEPARATION PLANTS
- OTHER GAS PLANTS
- WELDING EQUIPMENT PLANTS
- R & D LABORATORY

A4906

CX-335-G

PRINCIPAL FACILITIES

PRIOR SALES AND ESCROWED SHARES

Since October 12, 1972 the Company has issued a total of 5,914,944 shares of Common Stock. Of these shares, 5,861,100 were issued on October 12, 1972, December 28 and 31, 1972 in exchange for shares of the capital stock of Canadian Liquid Air Ltd., Liquid Air Inc., U.S. Divers Co., Dye Oxygen Company and Gulf Oxygen Industries, Inc., and 53,844 shares of Common Stock were issued to L'Air Liquide on December 22, 1972 for $999,960. Of the 5,861,100 shares, 90,471½ were received by American Air Liquide Inc. in exchange for 165 common shares of Dye Oxygen Company. The Company also issued on October 12, 1972 190,000 shares of Convertible Preferred Stock for $19,000,000 cash. (See "Material Contracts".)

On November 30, 1972 American Air Liquide Inc. sold 11,294½ shares of Common Stock of the Company to certain employees of the Company at a price of $18.57 per share.

In addition to the shares referred to above, on the day prior to the date of this Prospectus the Company sold to L'Air Liquide and its subsidiaries 115,000 shares of its Common Stock at a price of $ per share.

86,620½ shares of the Common Stock of the Company owned by certain Selling Stockholders are held in escrow by The Arizona Bank and Morgan Guaranty Trust Company pursuant to agreements with the Company terminating in December 1973.

MATERIAL CONTRACTS

Except for contracts entered into in the ordinary course of business, the only contracts which are presently material and which were entered into by the Company or any of its subsidiaries within two years preceding the date hereof are as follows:

(1) Underwriting Agreement dated , 1973 between the Company and Goldman, Sachs & Co. and Lazard Frères & Co., as representatives of the several underwriters (see "Underwriting").

(2) Reorganization Agreement, dated as of June 30, 1972, among the Company, L'Air Liquide, S.A., Canadian Liquid Air Ltd., Exxon Enterprises Inc., Liquid Air Inc., U.S. Divers Co., La Spirotechnique, Jacques Cousteau and others (see "Certain Transactions").

(3) Agreement, dated December 15, 1972, among the Company, Dye Oxygen Company, American Air Liquide Inc., and others pursuant to which the Company acquired all of the outstanding shares of Dye Oxygen Company in exchange for 516,530 shares of the Company.

(4) Plan and Agreement of Reorganization, dated December 20, 1972, among the Company, Gulf Oxygen Industries, Inc., and others pursuant to which the Company acquired all of the outstanding shares of Gulf Oxygen Industries, Inc. in exchange for 440,142½ shares of the Company.

(5) Credit Agreement, dated June 20, 1972, as amended, among Liquid Air Inc., Canadian Liquid Air Ltd., and the United California Bank, pursuant to which Liquid Air Inc. may borrow up to $11,000,000.

(6) Guaranty Agreement dated August 13, 1973, pursuant to which Liquid Air Inc. has guaranteed borrowings of up to $6,220,000 by the Company from the New York agency of a Canadian chartered bank.

Copies of the above material contracts will be available for public inspection at the executive offices of Canadian Liquid Air Ltd., 1210 Sherbrooke Street West, Montreal, Quebec, Canada.

A 4908

Cx-335-I

PURCHASERS' STATUTORY RIGHTS OF WITHDRAWAL AND RESCISSION

Sections 64 and 65 of The Securities Act (Alberta), sections 70 and 71 of The Securities Act, 1967 (Saskatchewan), sections 63 and 64 of The Securities Act (Manitoba) and sections 64 and 65 of The Securities Act (Ontario) provide in effect that, where a security is offered to the public in the course of distribution,

(a) a purchaser will not be bound by a contract for the purchase of such security if written or telegraphic notice of his intention not to be bound is received by the vendor or his agent not later than midnight on the second business day after the prospectus or amended prospectus offering such security is received or is deemed to be received by him or his agent; and

(b) a purchaser has the right to rescind a contract for the purchase of such security, while still the owner thereof, if the prospectus or any amended prospectus offering such security, as of the date of receipt or deemed receipt, contains an untrue statement of a material fact or omits to state a material fact necessary in order to make any statement therein not misleading in the light of the circumstances in which it was made, but no action to enforce this right can be commenced by a purchaser after the expiration of 90 days from the later of the date of such contract or the date on which such prospectus or amended prospectus is received or is deemed to be received by him or his agent.

Sections 61 and 62 of the Securities Act, 1967 (British Columbia) provide in effect that, where a security is offered to the public in the course of primary distribution,

(a) a purchaser, while still the owner thereof, has the right to rescind a contract for the purchase of a security if a copy of the last prospectus together with financial statements and reports and summaries of reports relating to the securities, as filed with the British Columbia Securities Commission, was not delivered to him or his agent prior to delivery of the written confirmation of the sale of the securities to either of them. Written notice of intention to commence an action for rescission must be served on the person who contracted to sell the security within 60 days of the date of delivery of the written confirmation, but no action shall be commenced after the expiration of three months from the date of service of such notice; and

(b) a purchaser, while still the owner thereof, has the right to rescind a contract for the purchase of such security if the prospectus or any amended prospectus offering such security contains an untrue statement of a material fact or omits to state a material fact necessary in order to make any statement therein not misleading in the light of the circumstances in which it was made, but no action to enforce this right can be commenced by a purchaser after the expiration of 90 days from (1) the date of such contract, or (2) the date on which such prospectus or amended prospectus is received or is deemed to be received by the purchaser or his agent, whichever date is the later.

Reference is made to the aforesaid acts for the complete texts of the provisions under which the foregoing rights are conferred and the foregoing summary is subject to the express provisions thereof.

CANADIAN

A 4909

CX-335-J

CERTIFICATE OF THE COMPANY

Dated: October 18, 1973

The foregoing constitutes full, true and plain disclosure of all material facts relating to the securities offered by this Prospectus as required by Part VII of The Securities Act, 1967 (British Columbia), Part 7 of The Securities Act (Alberta), Part VIII of The Securities Act, 1967 (Saskatchewan), Part VII of The Securities Act (Manitoba), Part VII of The Securities Act (Ontario) and the respective regulations thereunder, and under The Securities Act (Quebec), and by Section 13 of the Securities Act (New Brunswick).

(Signed) P. SALBAING, *President* (Signed) MIKE BREBER, *Vice President*

On behalf of the Board of Directors

(Signed) DONALD R. GANT, *Director* (Signed) E. A. DOMINIANNI, *Director*

CANADIAN

A 4910

CX-335-K

CERTIFICATE OF THE UNDERWRITERS

Dated: October 18, 1973

To the best of our knowledge, information and belief, the foregoing constitutes full, true and plain disclosure of all material facts relating to the securities offered by this Prospectus as required by Part VII of The Securities Act, 1967 (British Columbia), Part 7 of The Securities Act (Alberta), Part VIII of The Securities Act, 1967 (Saskatchewan), Part VII of The Securities Act (Manitoba), Part VII of The Securities Act (Ontario) and the respective regulations thereunder, and under The Securities Act (Quebec), and by Section 13 of the Securities Act (New Brunswick).

A. E. AMES & CO. LIMITED
(Signed) By: W. G. BANNAN

DOMINION SECURITIES CORPORATION HARRIS & PARTNERS LIMITED
(Signed) By: P. DUHAMEL

NESBITT THOMSON SECURITIES LIMITED
(Signed) By: A. S. H. TAYLOR

RICHARDSON SECURITIES OF CANADA
(Signed) By: JACQUES O. ADAM

CRANG & OSTIGUY INC.
(Signed) By: G. H. NATION

GREENSHIELDS INCORPORATED
(Signed) By: C. BLANCHARD

McLEOD, YOUNG, WEIR & COMPANY LIMITED
(Signed) By: W. E. MARSHALL

PITFIELD MACKAY, ROSS & COMPANY LIMITED
(Signed) By: WARREN Y. SOPER

LÉVESQUE, BEAUBIEN INC.
(Signed) By: B. E. DEBREYNE

The following includes the name of every person having an interest directly or indirectly to the extent of not less than 5% in the capital of:

A. E. AMES & CO. LIMITED: J. O. Hughes, E. C. Lipsit, P. D. G. Harris, P. M. Fisher, R. L. Brown, R. A. Gunn and P. L. Dixon;

GREENSHIELDS INCORPORATED: Peter Kilburn, Viscount Hardinge, Dudley Dawson, J. E. Brookes, W. T. Moran, B. F. Drummond, F. S. Martin, B. G. Willis, B. A. Goad, D. D. McConnell, J. B. Newman and E. D. Scott;

DOMINION SECURITIES CORPORATION HARRIS & PARTNERS LIMITED: D. H. Ward, W. B. Harris, F. H. Logan, A. S. Fell, G. S. Dembroski, J. B. Pitblado, M. H. Wilson, J. R. Gainor, J. J. Helbronner, S. F. Hughes and C. R. Younger;

McLEOD, YOUNG, WEIR & COMPANY LIMITED: J. S. Dinnick, G. C. MacDonald, C. P. Keelev. F. B. Farrill, R. M. Grills, W. J. Corcoran, L. E. Earlow, J. L. McLaughlin, A. T. L. Fraser and A. S. Brooke;

NESBITT THOMSON SECURITIES LIMITED: A. D. Nesbitt, J. I. Crookston, J. R. Oborne, J. R. Learn, D. E. M. Schaefer, D. N. Stoker, T. E. Kierans, R. W. Crosbie and J. B. Aune;

PITFIELD, MACKAY, ROSS & COMPANY LIMITED: W. C. Pitfield, D. L. Torrey, R. L. Hunter, A. F. MacAllaster, W. Y. Soper, D. C. Mackay and K. A. Wright;

RICHARDSON SECURITIES OF CANADA: George T. Richardson;

LÉVESQUE, BEAUBIEN INC.: A. Charron, L. Lévesque and S. E. Brock; and

CRANG & OSTIGUY INC.: J. Harold Crang, Jean P. W. Ostiguy, Jean P. Bousquet, Murray J. Howe and George H. Nation.

CANADIAN

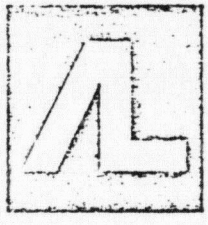
A4911

CX-385-L

736,333 Shares

Liquid Air Corporation of North America

Common Stock



CANADIAN

A 4912

CX-335-M

PRELIMINARY PROSPECTUS DATED OCTOBER 29, 1973

736,333 Shares

Liquid Air Corporation of North America

Common Stock

Of the shares of Common Stock being offered for sale hereby, 70,000 are being offered in Canada by Canadian Underwriters. Additional shares of the shares being offered for sale hereby may be offered in Canada to exempt Canadian purchasers. Of the total shares being offered, 175,000 are being sold by the Company and 561,333 are being sold by stockholders as stated herein under "Selling Stockholders." The Company will not receive directly any of the proceeds of the sale of the shares to be sold by the Selling Stockholders (see "Certain Transactions").

Prior to this offering there has been no public market for the Company's Common Stock. It is currently estimated that the initial public offering price per share may range from $24 to $26. Based on that price range, the market value of the presently outstanding Common Stock of the Company would range from approximately $142 million to $154 million. See "Underwriting" as to the method of determining the initial public offering price.

THESE SECURITIES HAVE NOT BEEN APPROVED OR DISAPPROVED BY THE SECURITIES AND EXCHANGE COMMISSION NOR HAS THE COMMISSION PASSED UPON THE ACCURACY OR ADEQUACY OF THIS PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

	Initial Public Offering Price	Underwriting Discount(1)	Proceeds to Company(2)	Proceeds to Selling Stockholders(2)
Per Share	$	$	$	$
Total	$	$	$	$

(1) See "Underwriting" for indemnification provisions.

(2) Before deducting expenses estimated at $ payable by the Company and $ payable by the Selling Stockholders.

These shares are offered severally by the Underwriters, as specified herein, subject to receipt and acceptance by them and subject to the right to reject any order in whole or in part. It is expected that stock certificates for the shares will be ready for delivery on or about November , 1973.

Goldman, Sachs & Co.

Lazard Frères & Co.

The date of this Prospectus is , 1973.

A4913

CX-335-N

No person has been authorized to give any information or to make any representation not contained in this prospectus and, if given or made, such information or representation must not be relied upon as having been authorized. This prospectus does not constitute an offering of any securities other than the registered securities to which it relates or an offer to any person in any State of the United States or Province of Canada where such offer would be unlawful. The delivery of this prospectus at any time does not imply that information herein is correct as of any time subsequent to its date.

Until , 1974 (90 days after the date of this prospectus) all dealers effecting transactions in the registered securities, whether or not participating in this distribution, may be required to deliver a prospectus. This is in addition to the obligation of dealers to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.

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IN CONNECTION WITH THIS OFFERING, THE UNDERWRITERS MAY OVER-ALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF THE COMMON STOCK OF THE COMPANY AT A LEVEL ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME.

A 4914

CX-335-O

PROSPECTUS SUMMARY

The following is a summary of certain information contained in this Prospectus.

Business ..... Liquid Air Corporation of North America is one of the principal producers and distributors of industrial gases in the United States and Canada. It is also in the related business of distributing welding equipment and supplies, some of which it manufactures. U. S. Divers Co., a wholly-owned subsidiary of the Company, is the leading manufacturer and distributor in the United States of underwater diving equipment which it sells under the name *Aqua-Lung®*. In addition, U. S. Divers manufactures and distributes personal life support equipment for fire fighting and industrial safety.

Securities ..... 736,333 shares of Common Stock are being offered hereby. 175,000 shares are being sold by the Company and 561,333 shares are being sold by certain stockholders. Of the shares of Common Stock being offered for sale, 70,000 are being offered in Canada by Canadian Underwriters.

Use of Proceeds .... The net proceeds to be received by the Company from this offering will be added to the general funds of the Company and will be available for its capital expenditure program. Initially the proceeds will be used to reduce short-term indebtedness.

Selected Financial Information ..... The following consolidated financial information has been extracted from material presented elsewhere in this Prospectus and should be read in conjunction with the consolidated financial statements and notes thereto. Except for per share amounts, all figures are in thousands of dollars.

	Year Ended December 31,		6 Months Ended June 30, (Unaudited)			3 Months Ended September 30, (Unaudited)		
	1972	Pro-forma(a) 1972	1972	Pro-forma(a) 1972	1973	1972	Pro-forma(a) 1972	1973
		(Unaudited)						
Net Sales	$118,787	$136,214	$59,577	$68,317	$82,077	$29,303	$33,614	$38,791
Earnings Before Extraordinary Items	$ 7,994	$ 8,948	$ 4,393	$ 4,906	$ 5,861	$ 1,790	$ 2,027	$ 2,236
Net Earnings	$ 7,994	$ 8,948	$ 4,393	$ 4,906	$ 6,293	$ 1,790	$ 2,027	$ 2,455
Per Common and Common Equivalent Share(b):								
Earnings Before Extraordinary Items	$1.34	$1.29	$0.74	$0.71	$0.85	$0.30	$0.29	$0.32
Extraordinary Items	—	—	—	—	$0.06	—	—	$0.03
Net Earnings	$1.34	$1.29	$0.74	$0.71	$0.91	$0.30	$0.29	$0.35

	December 31, 1972	June 30, 1973 (Unaudited)
Working Capital	$ 26,796	$ 26,429
Total Assets	$147,816	$159,309
Total Assets less Intangibles	$131,569	$143,074
Total Indebtedness	$ 46,297	$ 52,168
Shareholders' Equity	$ 79,352	$ 83,572

(a) The pro-forma statements reflect the acquisitions of Dye Oxygen Company and Gulf Oxygen Industries, Inc. made as of the end of 1972 and the effect of Canadian withholding taxes on dividends of the Canadian subsidiary (see Note (6) of Notes to Consolidated Statements of Earnings).

(b) Average number of common shares and equivalents outstanding for the pro-forma 1972 and the 1973 statements was 6,929,069. For the actual 1972 statements it was 5,972,397. (See Note (4) of Notes to Consolidated Statements of Earnings.)

CX-335-P

THE COMPANY

Liquid Air Corporation of North America is one of the principal producers and distributors of industrial gases in the United States and Canada. It is also in the related business of distributing welding equipment and supplies, some of which it manufactures. U. S. Divers Co., a wholly-owned subsidiary of the Company, is the leading manufacturer and distributor in the United States of underwater diving equipment which it sells under the name *Aqua-Lung®*. In addition, U. S. Divers manufactures and distributes personal life support equipment for fire fighting and industrial safety.

The following table sets forth for the periods shown the contribution, in thousands of dollars, of each of these activities to the Company's sales and earnings. (All dollar figures in this table and elsewhere in this Prospectus are in U. S. currency unless otherwise stated.)

	Industrial Gases		Welding Products		Underwater Diving & Life Support Equipment	
	Sales	Earnings(a)	Sales	Earnings(a)	Sales	Earnings(a)
1968	$23,381	$ 6,670	$14,538	$1,321	$ 7,681	$ 651
1969	33,751	8,021	21,616	1,112	8,257	333
1970	50,071	10,065	30,433	2,938	10,002	431
1971	56,400	10,877	32,942	3,145	10,990	591
1972	66,904	15,898	39,008	3,855	12,875	1,518
1972 Pro Forma(b)	75,136	18,732	48,203	4,721	12,875	1,518

(a) Before certain general and administrative expenses, interest expense, other income, income taxes and losses from discontinued operations.

(b) Includes for the full year 1972, results of Dye Oxygen Company and Gulf Oxygen Industries, Inc., which were acquired effective December 31, 1972.

The Company, through its wholly-owned subsidiary, Canadian Liquid Air Ltd., and its predecessors, has been engaged in the industrial gas and welding products business in Canada since 1911. The Company entered the United States market in 1969 through the acquisition of American Cryogenics, Inc., which was engaged in the same lines of business, operating primarily in the Southeast and in Texas and California. Also in 1969, it expanded its activities into the Pacific Northwest and Alaska through the acquisition of Industrial Air Products Co. The Company has recently expanded in the Southwest through the purchase of Dye Oxygen Company ("Dye") and into Louisiana through the purchase of Gulf Oxygen Industries, Inc. ("Gulf"). These United States operations are being consolidated into Liquid Air Inc., a wholly-owned subsidiary.

As indicated by the map on the inside front cover of this Prospectus, the Company's industrial gas operations are concentrated in areas outside of the heavily industrialized eastern and midwestern regions of the United States, which regions represent the largest markets for industrial gases. However, in those areas of the United States where it operates, considered as a whole, the Company believes that it is among the leading producers of industrial gases. It is the largest producer of industrial gases in Canada.

The Company was incorporated in Delaware in 1970 and commenced operations in 1972 as a result of the reorganization of certain North American operations of L'Air Liquide*, a French company with worldwide operations and consolidated 1972 sales in excess of $600,000,000. After giving effect to this

* L'Air Liquide, Société Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude.

offering and the purchase of certain shares through reinvestment of dividends (see "Certain Transactions"), L'Air Liquide and its subsidiaries will own an aggregate of 78.3% of the outstanding Common Stock of the Company, or 67.7% assuming full conversion of the Company's Convertible Preferred Stock, all of which is owned by Exxon Enterprises Inc. (see "Principal Stockholders").

L'Air Liquide was founded in 1902 to commercialize three fundamental discoveries of several French scientists: a process for separating air into its component parts, a process for storing acetylene under pressure and the oxy-acetylene welding and cutting torches. L'Air Liquide is one of the world's leading producers of industrial gases and welding products. It is also a leader in the engineering and construction of air separation plants and in the development of applications in the field of cryogenics (the production and utilization of very low temperatures).

The Company's corporate headquarters are located at 405 Lexington Avenue, New York, New York 10017. Its telephone number is 212-661-1785. Unless the context indicates otherwise, the "Company", as used herein, refers to Liquid Air Corporation of North America, its subsidiaries and their predecessors.

USE OF PROCEEDS

The net proceeds to be received by the Company from this offering, estimated to be approximately $, will be added to the general funds of the Company and will be available for its capital expenditure program (see "Industrial Gases—Production" under "Business"). Initially the proceeds will be used to reduce short-term indebtedness. The Company will not receive directly any of the proceeds from the shares being sold by Selling Stockholders (see "Certain Transactions").

DIVIDENDS

The payment of cash dividends is subject to the discretion of the Board of Directors and depends on various factors including earnings and the financial condition of the Company as well as guidelines issued under the United States Government's program for voluntary restraint in the payment of dividends. The Board of Directors has declared a quarterly dividend of $.175 per share payable on December 17, 1973 to stockholders of record on December 3, 1973. See "Description of Capital Stock" for certain restrictions on the payment of dividends. Dividend payments to Canadian stockholders will, in most cases, be subject to United States income tax which may be withheld at a rate which is at present 15%.

A special dividend of $.55 per share will be paid on October 29, 1973 (see "Certain Transactions" for information concerning partial reinvestment of this dividend). Excluding this special dividend, to date in 1973 the Company has paid dividends of $.475 per share on its Common Stock.

During the year ended December 31, 1972 Liquid Air Corporation of North America paid a dividend of $.52 per share of Common Stock.

No dividends were paid or payable on the shares of Preferred Stock prior to January 1, 1973. For information as to dividends payable on shares of Preferred Stock subsequent to January 1, 1973, see "Description of Capital Stock" and Note F of Notes to Financial Statements.

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CAPITALIZATION

The following table sets forth the capitalization of the Company and its consolidated subsidiaries as of June 30 and September 30, 1973 and as of September 30, 1973, as adjusted to give effect to the sale of 175,000 shares of Common Stock offered hereby, the conversion of 6,684 shares of Preferred Stock, the sale of 115,000 shares of Common Stock upon reinvestment of certain dividends and an increase of $3,500,000 in a note payable to an affiliate together with a corresponding reduction of short-term bank indebtedness (see "Certain Transactions").

Title of Class	Outstanding at June 30, 1973	Outstanding at September 30, 1973	As Adjusted at September 30, 1973
	(Thousands of Dollars)		
SHORT-TERM DEBT:			
Bank indebtedness, generally at prime plus 1%, with no compensating balances	$12,270	$13,110	$ 9,610
Notes payable to affiliate, interest at 8½% to 9½%	730	730	730
Current maturities of long-term debt	3,916	3,860	3,860
Total Short-Term Debt	$16,916	$17,700	$14,200
LONG-TERM DEBT(1):			
Notes payable to affiliate, 8½% due October 11, 1977	$ 8,000	$ 8,000	$11,500
Note payable to a bank, interest at 1% above prime due through 1978	11,000	11,000	11,000
Notes payable to insurance companies, interest at 6% to 6¼% due through 1981	1,561	1,494	1,494
Conditional purchase contracts due through 1977	917	852	852
Notes and other debt payable through 1981 (approximate average interest rate 6½%)	2,562	2,488	2,488
6½% sinking fund debentures due May 2, 1986(2)	5,107	5,071	5,071
9¾% sinking fund debentures due December 1, 1990(2)	6,008	5,967	5,967
5¾% first mortgage sinking fund bonds due January 15, 1982(2)	2,873	2,853	2,853
Conditional purchase contracts due through 1977 and 8% promissory notes due through 1979(2)	1,140	1,076	1,076
	39,168	38,801	42,301
Less current maturities of long-term debt	3,916	3,860	3,860
Total Long-Term Debt	$35,252	$34,941	$38,441
CAPITAL:			
Preferred stock, convertible, par value $100 per share—authorized 190,000 shares			
Issued (actual)—190,000 shares	$19,000	$19,000	—
Issued (as adjusted)—183,316 shares	—	—	$18,332
Common stock, no par value—authorized 10,000,000 shares(3)			
Issued (actual)—5,914,944 shares	17	17	—
Issued (as adjusted)—6,240,619 shares	—	—	
Paid-in capital	53,023	53,023	
Retained earnings as at June 30, 1973	11,532	11,532	11,532
Total Capital	$83,572	$83,572	$

CX-335-S

NOTES TO CAPITALIZATION

(1) See Note D of Notes to Financial Statements for additional details concerning maturities, sinking fund requirements and other matters.

(2) Payable in Canadian dollars (expressed above in U.S. dollars).

(3) At June 30 and September 30, 1973, 1,014,125 shares were reserved for the conversion of the Preferred Stock at the rate of 5.3375 for 1. As adjusted at September 30, 1973, 978,450 shares were so reserved. See also Note F of Notes to Financial Statements.

(4) Reference is made to Note H of Notes to Financial Statements for information concerning long-term lease commitments.

On March 28, 1973, the outstanding Common Stock of the Company was split on the basis of three and one-half shares for each share outstanding. The information presented in this Prospectus has been adjusted to give effect to such stock split.

CX-335-T

LIQUID AIR CORPORATION OF NORTH AMERICA AND SUBSIDIARIES

A-4919

CONSOLIDATED STATEMENTS OF EARNINGS

The following consolidated statements of earnings represent the combined actual results of operations of Liquid Air Corporation of North America (the Company) and its subsidiaries for the entire period since January 1, 1968 during which the subsidiaries were under the common control of L'Air Liquide (see Note A of Notes to Financial Statements) and the pro-forma comparative results for the year 1972 and the six months ended June 30, 1972 reflecting the acquisitions of Dye Oxygen Company and Gulf Oxygen Industries, Inc. and the effect of Canadian withholding taxes on dividends of the Canadian subsidiary (see Note (6)). The actual results for the three years ended December 31, 1972 have been examined by Ernst & Ernst, independent accountants, whose report is included elsewhere in the Prospectus. The opinion of Ernst & Ernst is based in part on the reports of other auditors as set forth therein. As to the actual results for the years 1968 and 1969, the financial statements of the individual constituent companies have been examined by independent accountants whose reports are included in the Prospectus and the compilation of the combined statements has been reviewed by Ernst & Ernst to the extent set forth in their aforementioned report. The information for the six month periods ended June 30, 1972 and June 30, 1973 is unaudited but in the opinion of management includes all adjustments (consisting only of normal recurring accruals) considered necessary to a fair presentation of the operations for these periods. The following statements should be read in conjunction with the other financial statements of the Company and the notes thereto.

	Actual Years Ended December 31,					Pro-forma(6) Year Ended December 31,	6 Months Ended June 30,		
	1968	1969	1970	1971	1972	1972 (Unaudited)	1972 (Actual) (Unaudited)	1972 (Pro-forma)(6) (Unaudited)	1973 (Actual)(7) (Unaudited)
	(Thousands of Dollars)								
Net sales(1)	$45,600	$63,624	$90,506	$100,332	$118,787	$136,214	$59,577	$63,317	$82,077
Other income	323	703	911	782	776	1,016	262	346	637
	45,923	64,327	91,417	101,114	119,563	137,230	59,839	68,663	82,714
Costs and expenses(1):									
Cost of products sold	21,520	32,325	45,286	52,180	60,583	69,893	30,206	34,891	43,484
Selling, distribution, general and administrative expenses	13,700	20,632	30,554	31,869	34,850	39,516	16,971	19,227	22,316
Depreciation and amortization (principally applicable to cost of products sold)	3,277	4,031	5,607	5,893	6,779	7,639	3,342	3,744	4,065
Interest	756	1,668	2,930	2,857	3,155	3,380	1,548	1,668	1,860
	39,253	58,656	84,377	92,809	105,358	120,428	52,067	59,530	71,725
	6,670	5,671	7,040	8,305	14,205	16,802	7,772	9,133	10,989
Income taxes(1)(2):									
Current	3,675	3,155	2,917	2,760	5,298	6,424	2,882	3,505	4,388
Deferred	(375)	(129)	763	953	913	1,430	497	721	745
	3,300	3,026	3,680	3,713	6,211	7,854	3,379	4,227	5,133
Earnings from continuing operations before extraordinary items	3,370	2,645	3,360	4,592	7,994	8,948	4,393	4,906	5,861
Loss from discontinued operations—Net of income tax(1)	(693)	(335)	(207)	—	—	—	—	—	—
Earnings before extraordinary items	2,677	2,310	3,153	4,592	7,994	8,948	4,393	4,906	5,861
Extraordinary items(3)	535	211	—	—	—	—	—	—	437
Net earnings(6)	$ 3,212	$ 2,521	$ 3,153	$ 4,592	$ 7,994	$ 8,948	$ 4,393	$ 4,906	$ 6,298
Average number of common shares and equivalents outstanding(4)	4,958,272	5,380,824	5,972,397	5,972,397	5,972,397	6,929,069	5,972,397	6,929,069	6,929,069
PER COMMON AND COMMON EQUIVALENT SHARE(4)(6):									
Earnings from continuing operations before extraordinary items	$0.68	$0.49	$0.56	$0.77	$1.34	$1.29	$0.74	$0.71	$0.85
Loss from discontinued operations	(0.14)	(0.06)	(0.03)	—	—	—	—	—	—
Extraordinary items	0.11	0.04	—	—	—	—	—	—	0.06
Net earnings	$0.65	$0.47	$0.53	$0.77	$1.34	$1.29	$0.74	$0.71	$0.91

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[illegible]	$ [illegible]	$ [illegible]	$ 3,433	$ [illegible]	$ 7,994	$ 8,918	$ 4,393	$ 4,956	$ [illegible]
Average number of common shares and equivalents outstanding (4)	4,958,272	5,380,824	5,972,397	5,972,397	5,972,397	6,929,069	5,972,397	6,929,069	6,929,069
PER COMMON AND COMMON EQUIVALENT SHARE (4) (6):									
Earnings from continuing operations before extraordinary items	$0.68	$0.49	$0.56	$0.77	$1.34	$1.29	$0.74	$0.71	$0.85
Loss from discontinued operations	(0.14)	(0.05)	(0.03)	—	—	—	—	—	—
Extraordinary items	0.11	0.04	—	—	—	—	—	—	0.06
Net earnings	$0.65	$0.47	$0.53	$0.77	$1.34	$1.29	$0.74	$0.71	$0.91

( ) denotes deductions

NOTES TO CONSOLIDATED STATEMENTS OF EARNINGS

(1) Net sales excludes $7,412,000 for 1968, $3,315,000 for 1969 and $151,000 for 1970 applicable to the discontinued operations of the engineering and construction division of Canadian Liquid Air Ltd. and an engineering division of U.S. Divers. Related costs, expenses and income tax effect have likewise been excluded from the amounts reported above and the net loss is reported as a single item.

(2) The provision for income taxes consists almost entirely of Canadian income taxes except for current and deferred U.S. income taxes of $209,000 and $0, respectively, in the 1971 actual results; $1,776,000 and $71,000, respectively, in the 1972 actual results; $2,527,000 and $589,000, respectively, in the 1972 pro-forma results; $1,611,000 and $78,000, respectively in the June 30, 1972 actual results; $1,668,000 and $319,000, respectively, in the June 30, 1972 pro-forma results; and $2,059,000 and $259,000, respectively, in the June 30, 1973 actual results. The U.S. investment credit has been accounted for on the flow-through method and amounted to $200,000 and $389,000 in the 1972 actual and pro-forma results, respectively, and $98,000, $300,000 and $225,000 in the June 30, 1972 actual results, June 30, 1972 pro-forma results and June 30, 1973 actual results, respectively. The effective income tax rate in 1969 and 1970 was disproportionately high because of losses incurred by a U.S. subsidiary for which no tax benefit was accrued. Tax benefits realized in 1972 of approximately $1,200,000, resulting from tax losses carried forward by a U.S. subsidiary from periods prior to acquisition, have been treated as a reduction of purchase cost rather than as a credit to income. At June 30, 1973, there were additional tax loss carry forwards of about $3,000,000 relative to the period subsequent to acquisition, expiring from 1974 to 1976.

(3) Extraordinary items in 1968 and 1969 consist of capital gains on sale or other conversion of properties in Canada which were not subject to income tax and in the June 30, 1973 results consist of a tax credit arising from the utilization of tax loss carry forwards.

(4) Earnings per share for the actual results through December 31, 1972 are based on the number of common shares outstanding at December 31, 1972 (exclusive of shares issued in the acquisitions of Gulf and Dye whose operations are not included in the actual consolidated statements for any period other than the six months ended June 30, 1973) and the average number of common equivalent shares applicable to the preferred stock initially issued August 1, 1969, all adjusted to reflect a 5.5 for 1 stock split effective March 1973. The pro-forma results and the actual June 30, 1973 results reflect the additional shares issued in the acquisition of Dye and Gulf. A supplemental computation based on the average number of shares which would have been outstanding in each of the last five years using the ratio of exchange used in the October 1972 reorganization would result in net earnings per common and common equivalent share for the actual results of: 1968—$.75; 1969—$.52; 1970—$.55; 1971—$.78; and 1972—$1.35; and for the pro-forma results of 1972—$1.34 and six months ended June 30, 1972 pro-forma—$.71. Beginning January 1, 1972, the Preferred Stock is non-participating, is entitled to an annual dividend of $3.50 per share [illegible] Capital Stock, and [illegible] payment would dilute earnings per common share in any [illegible] 1972 or [illegible] common and common equivalent share are less than $1.03.

(5) Cash dividends paid prior to 1973 (all of which were paid to L'Air Liquide) have not been reflected [illegible] considered relevant to a current evaluation. Cash dividends declared and paid during the six months ended June 30, 1973 amounted to $0.30 per common share and $1.50 per preferred share.

(6) The pro-forma statements for the year 1972 and the six months ended June 30, 1972 combine the [illegible] with results of Dye and Gulf. The pro-forma statements reflect retroactively the effect of [illegible] acquired companies made as of the end of 1972. Also, it is the intention of the Company to [illegible] Canadian subsidiaries equal to 50% of their net earnings, and the pro-forma statements include the [illegible] holding taxes that would apply had such a policy been in effect during the respective periods.

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NOTES TO CONSOLIDATED STATEMENTS OF EARNINGS—(Continued)

A reconciliation of the pro-forma net earnings with amounts reported in the separate statements of the companies follows:

	Year Ended December 31, 1972	Six Months Ended June 30, 1972
	(Thousands of Dollars)	
As reported by:		
Liquid Air Corporation of North America	$7,994	$4,393
Dye Oxygen Company	687	353
Gulf Oxygen Industries, Inc.	517	298
Total	$9,198	$5,044
Pro-forma adjustments to reflect appraisal values and revised estimated useful lives of property and equipment, and amortization of cost in excess of net assets:		
Additional depreciation based on appraisal values (not deductible for income tax purposes):		
Dye	$ (102)	$ (51)
Gulf	(122)	(61)
Reduced depreciation based on revised estimated useful lives:		
Dye (after deferred income taxes of $189,000 and $92,000 respectively)	206	101
Gulf (after deferred income taxes of $276,000 and $128,000 respectively)	300	137
Amortization of cost in excess of net assets (not deductible for income tax purposes):		
Dye	(92)	(46)
Gulf	(65)	(33)
Effect of Canadian withholding taxes on dividends of the Canadian subsidiaries as described above	(375)	(185)
Total	$8,948	$4,906

Certain comparative pro-forma figures for the years ended December 31, 1971 and 1972 are as follows:

	1971	1972
Net sales (000's)	$115,682	$136,214
Net earnings (000's)	$ 5,289	$ 8,948
Average number of common shares and equivalents outstanding	6,929,069	6,929,069
Net earnings per share	$0.76	$1.29

(7) Dividends paid by Canadian subsidiaries to a U.S. parent are presently subject to a 15% withholding tax. This tax and Canadian income taxes are allowed as a credit against U.S. income taxes applicable to income earned in Canada to the extent they do not exceed such U.S. taxes. The effect of such withholding taxes on future years' earnings will depend upon the amount of dividends remitted by the Canadian subsidiaries, the rate of withholding tax and the effective tax rates of the United States and Canada. June 30, 1973 results include provision for such withholding taxes based on the policy described in Note (6) above.

The decline in profit margins in 1969 and 1970 resulted directly from the Company's entry into the United States market through the acquisition of American Cryogenics, Inc. which had incurred substantial operating losses prior to the acquisition (see "condensed summary of earnings" below) and which, excluding the results of Industrial Air Products Co., continued to operate at deficits during the last five months of 1969 and in 1970. Earnings were also adversely affected during these periods by increased

interest charges resulting from debt incurred in the acquisition of Industrial Air Products Co. The improvement in earnings in 1972 reflects primarily the results of programs previously initiated by management to improve the profitability of its industrial gas and welding products operations in the United States, including extensive cost reductions and the elimination of unprofitable sales, together with continued growth in sales and earnings of its Canadian operations. The effect of these factors on the Company's financial results is indicated by the following table which shows the percentage contribution of the Company's United States operations (including U. S. Divers) to net sales and earnings from continuing operations before interest and income taxes for the years 1968-72 and pro-forma 1972. The Company anticipates that the percentage contributions for 1973 will approximate those shown for pro-forma 1972.

	1968	1969	1970	1971	1972	Pro-forma 1972
Net Sales	17%	37%	52%	53%	52%	58%
Earnings	9	12	18	19	36	45

The following is a condensed summary of net sales and earnings of companies acquired by Liquid Air Corporation of North America for the periods prior to the acquisition dates.

Acquisitions as of August 1, 1969(a)			Acquisitions made as of December 31, 1972 12 Months Periods(a)				
1968	1969		1968	1969	1970	1971	1972
(Thousands of Dollars)			(Thousands of Dollars)				
		NET SALES:					
$19,932	$12,187	American Cryogenics					
16,753	9,507	Industrial Air Products					
		Dye	$3,985	$4,545	$5,908	$7,147	$8,347
		Gulf	5,994	6,290	8,287	8,203	9,080
		EARNINGS (LOSSES) FROM CONTINUING OPERATIONS BEFORE EXTRAORDINARY ITEMS:					
(3,537)	(1,568)	American Cryogenics					
784	298	Industrial Air Products					
		Dye	163	337	510	523	687
		Gulf	370	275	316	384	517
		NET EARNINGS (LOSSES):					
(4,132)	(3,777)	American Cryogenics					
784	298	Industrial Air Products					
		Dye	163	373	510	523	687
		Gulf	370	260	223	384	517

(a) All amounts reflect the results for 12 months of operations, some at different fiscal year ends, except the amounts of American Cryogenics and Industrial Air Products for the year 1969 which cover periods of seven and six months, respectively.

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The following tabulation summarizes the results of operations of the Company for the three months ended September 30, 1972 on an actual and a pro-forma basis and for the three months ended September 30, 1973. The information for these periods is unaudited but in the opinion of management includes all adjustments (consisting only of normal recurring accruals) considered necessary to a fair presentation of the operations for these periods. Except for per share amounts, all figures are in thousands of dollars.

	3 Months Ended September 30, (Unaudited)		
	1972	Pro-forma(a) 1972	1973
Net Sales	$29,303	$33,614	$38,791
Earnings before Income Taxes and Extraordinary Item	$ 3,058	$ 3,706	$ 4,015
Earnings before Extraordinary Item	$ 1,790	$ 2,027	$ 2,236
Extraordinary Item(b)	—	—	$ 219
Net Earnings	$ 1,790	$ 2,027	$ 2,455
Per Common and Common Equivalent Share:			
Earnings Before Extraordinary Item	$0.30	$0.29	$0.32
Extraordinary Item(b)	—	—	$0.03
Net Earnings	$0.30	$0.29	$0.35

(a) The pro-forma statement reflects the acquisitions of Dye and Gulf made as of the end of 1972 and the effect of Canadian withholding taxes on dividends of the Canadian subsidiary (see Note (6) of Notes to Consolidated Statements of Earnings).

(b) Tax benefits realized resulting from tax losses carried forward by a U.S. subsidiary.

As compared to comparable prior periods on a pro-forma basis, the rate of increase in earnings for the three months period ended September 30, 1973 was not as great as that of the six months period ended June 30, 1973, principally due to (i) a reduced rate of increase in sales, (ii) the higher cost of interest on bank indebtedness and (iii) higher than normal transportation costs associated with product shortages in certain areas of the United States (see "Industrial Gases—Production" under "Business" for information concerning expansion in production capacity).

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BUSINESS

Industrial Gases

The following table shows the contribution of the various gases sold by the Company to total sales, in thousands of dollars. (This table and all other statistical information in this Prospectus, unless otherwise noted, excludes Gulf and Dye.)

	Oxygen(1)	Nitrogen	Sundry Gases(2)	Fuel Gases	Gas Related Revenues(3)
1970	$19,799	$6,391	$ 8,677	$8,058	$7,146
1971	21,366	8,070	9,811	8,691	8,462
1972	25,753	9,994	11,730	9,738	9,689

(1) Includes oxygen sold for medical purposes.

(2) Sundry gases include: argon, carbon dioxide, hydrogen, helium, specialty gases, and medical gases other than oxygen.

(3) Includes rental and demurrage for certain distribution equipment and the sale of medical equipment and supplies.

Uses of Industrial Gases

Growth in demand for oxygen and nitrogen in recent years is partially accounted for by the development of new uses for these gases. This is particularly true for nitrogen which was once a largely unused by-product of oxygen-producing plants. A number of these new uses were made economical because of lower sales prices due to significant gains in plant productivity and more efficient methods of distribution.

Oxygen derives widespread and continuing uses from its fundamental property of supporting combustion, from its important place in the structure of a wide variety of mineral and organic compounds and from the role it plays in sustaining life. Oxygen is used in the manufacture of steel, by construction and steel fabrication industries for welding and cutting, to increase efficiency in kilns and industrial furnaces, in copper, nickel, and lead smelting, and in the chemical and petrochemical industries. In addition, oxygen is used in medical treatment, particularly by hospitals.

In recent years, increasing uses have been found for nitrogen because of its relative inertness in its gaseous state and its deep freezing and brittling capabilities in its liquefied state. In its gaseous state, nitrogen is used for high temperature treatment of metals, for blanketing, purging, or processing in the chemical, petrochemical, plastic and glass industries, for purging and inerting tankers and containers, and for food processing and packaging. In its liquid state, nitrogen is used in the freezing of perishable food products, in the plastics and rubber industries for deflashing and grinding, in metallurgy for subzero quenching and blanketing of metals, and for fragmentation in the selective recovery of waste materials.

Sundry gases include argon, carbon dioxide, hydrogen, helium and specialty gases such as krypton, xenon and other high purity gases. The two principal gases in this category are argon, which is used in the manufacture of lamps and electronic equipment and in the refining of specialty metals, and carbon dioxide, which is primarily used by the carbonated beverage industry and for food chilling and packaging. Both argon and carbon dioxide, and to a much lesser extent helium, are also widely used as shielding agents in automatic and semiautomatic welding processes. The other gases under this heading have numerous specialized applications in industry and research laboratories. In addition to oxygen used for medical purposes, the Company supplies nitrous oxide, compressed air and standard medical gas mixtures, and a line of medical equipment used in the distribution of gases throughout a hospital.

The Company estimates its direct sales of oxygen, nitrogen and sundry gases to be distributed as follows among the main categories of users: primary metal production 20%, metal fabrication 17%, health and medical applications 13%, chemical and petrochemical industries 8%, petroleum industry and

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welding 7%, transportation equipment manufacturing 7%, electronic and electrical industries 6%, construction 3%, food and beverages 3%, and others 16%.

Fuel gases are used in welding and cutting processes and are sold to metal-working industries, to construction industries (for applications such as pipeline construction), to transportation equipment industries (automotive, railroads and shipbuilding) and to other manufacturing industries.

The Company's ability to assist customers in developing new processes involving the use of its products is highly important. Consequently, through its own research department, and in conjunction with L'Air Liquide, the Company actively investigates new uses for oxygen, nitrogen and other gases. Currently special emphasis is being given to the fields of pollution control, flame enrichment, food processing and metal refining (see "Research and Development" below).

Marketing and Customer Services

Approximately 79% of the Company's industrial gas sales are made through 82 regional and sales offices to 47,000 customers. The balance of 21% is through 151 independent distributors whose main business is generally the distribution of the Company's products. No customer accounted for as much as 5% of the Company's total 1972 sales. Most medical gases and supplies are sold by specialized salesmen who provide additional services such as assisting in the design of internal pipeline systems for hospitals, servicing oxygen therapy equipment and presenting safety lectures.

The Company's customers require industrial gases in either gaseous or liquid state and in widely varying volumes. The gas products, therefore, may be delivered in high pressure or liquid cylinders, a variety of specialized cryogenic transport vehicles, or pipelines.

Approximately 57% of 1972 industrial gas sales were delivered in Company-owned cylinders. Close to a third of such sales are channeled to numerous customers through the distributor network. Most distributors deliver their gas products in cylinders, although the Company itself may sell bulk liquefied gas to these distributors.

Sales of bulk liquefied gases, which include all major industrial gases with the exception of acetylene, accounted for 29% of industrial gas sales in 1972. These sales were made to approximately 1,550 customers, and were principally under contracts varying in length from one to ten years.

Pipeline sales, mostly of gaseous oxygen and nitrogen, accounted for 14% of 1972 industrial gas sales and were made to 22 customers. These sales are made to customers located near the Company's plants and are under contracts varying in length from five to fifteen years, which have price escalation clauses to protect the Company from possible increases in production costs.

The regular supply of gases is critical to the operations of the Company's customers. To insure reliable service and prompt and efficient attention to the needs of its customers, the Company maintains liquid reserve storage tanks at all of its production facilities, and liquid-to-gas converters on the premises of certain customers and at cylinder filling stations owned by the Company. Since much of this equipment is in the hands of customers, the Company charges a facility fee on bulk cryogenic equipment and demurrage on cylinders. It owns, leases and operates a fleet of high pressure gas trailers and cryogenic distribution equipment, including 24 railroad tank cars and approximately 440 trucks and other motor vehicles.

Production

The principal gases sold by the Company are extracted from the atmosphere through a process in which air is cooled to the point at which it becomes liquid. This liquid is then separated through fractional distillation into its basic components, nitrogen (78%), oxygen (21%) and argon and rare gases (1%).

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Most of the Company's plants were designed and built by AL E. & C. Ltd., a wholly-owned North American subsidiary of L'Air Liquide, or its predecessor, the engineering and construction division of Canadian Liquid Air Ltd. (see "Certain Transactions"). Including the plants acquired in the recent purchases of Dye and Gulf, the Company operates fifteen air separation plants on Company premises (see "Property" and map on inside front cover of this Prospectus) and three additional plants on customer premises. Ten have a capacity in excess of 150 tons per day. One of these plants, located in Hamilton, Ontario, is among the largest air separation facilities in North America with a daily capacity of 2,000 tons of oxygen and 1,000 tons of nitrogen. Although the Company has some flexibility to vary the output of its plants between oxygen and nitrogen, depending on customer demands and purity requirements, the Company estimates that its daily production capacity is over 3,500 tons of oxygen and 2,500 tons of nitrogen, including 1,375 tons of liquid oxygen, nitrogen or argon. During 1972 the Company sold approximately 67% of the rated oxygen capacity of its facilities, 57% of the rated nitrogen capacity and 80% of the rated liquefied gas capacity. During 1973 the Company has operated at substantially higher levels of capacity utilization.

The Company has recently completed construction of a new plant at its Hamilton, Ontario complex for the production of 175 tons per day of liquid products. Presently under construction are two other major expansions of its production facilities: in the Seattle-Tacoma area, a new air separation plant with a capacity of 175 tons per day of liquid products expandable by another 225 tons per day is nearing completion; and in Edmonton, Alberta, the addition of a new 40 ton per day plant which is scheduled to commence production in the spring of 1974. The combined cost of these two facilities, excluding the potential expansion of the Seattle-Tacoma facility, is expected to be $5,150,000, most of which has been spent in 1973. The Company has also announced its intention to build a new air separation facility in South Carolina with a capacity similar to that of the Seattle-Tacoma plant at a cost of approximately $5 million. Construction of this plant is expected to commence in the spring of 1974.

Production and distribution facilities are also operated for a number of gases obtained from sources other than the atmosphere: acetylene, carbon dioxide and hydrogen. The Company produces acetylene by reacting water with calcium carbide and by processing acetylene purchased as a by-product from petrochemically manufactured ethylene. The Company purchases nitrous oxide, helium and *MappⓇ* (a fuel gas) from other manufacturers; it is a partner in a joint venture for the production of carbon dioxide, and it produces specialty gases such as krypton and xenon.

Welding Products

In conjunction with its industrial gas business, the Company sells welding products, a portion of which it manufactures itself. Approximately half of welding products sales in 1972 were accounted for by consumables such as electrodes, solid wire and tubular wire. Welding equipment includes torches, regulators, and electrical equipment, such as wire feeders and power sources. Automatic and semi-automatic welding processes are gaining increased acceptance in industry, and the Company's sales for such processes represent the fastest growing part of its welding products business.

The Company's welding products sales are mainly directed to the metal working industries, construction industries (including pipeline installations), the railroad and automotive industries and shipyards. In addition, welding products are regularly used in maintenance work throughout industry. Substantially all sales are handled through the same network of regional sales offices and distributors which services the industrial gas market.

Within its United States marketing regions, the Company distributes the welding products of a number of major manufacturers, and is a leading distributor for such welding products. The Company is

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the largest manufacturer of welding products in Canada, producing over 50% of its Canadian welding products sales. In addition to a 49% interest in Miller Welders Canada Ltd., a manufacturer of electric welding machines, the Company owns and operates a welding-wire plant, an electrode plant and a welding equipment manufacturing plant.

Underwater Diving and Life Support Equipment

The Company's subsidiary, U. S. Divers Co., is the leading manufacturer and distributor of underwater diving equipment in the United States. These products, most of which are sold to the leisure market under the name *Aqua-Lung*®, accounted for 87% of U. S. Divers' 1972 sales. The diving equipment line includes the complete breathing system comprising high pressure air cylinders and pressure regulating devices, and accessories such as fins, masks, protective clothing, spearguns, knives, watches, depth gauges and underwater cameras. In certain cases U. S. Divers purchases equipment from other manufacturers for resale. Throughout all stages of manufacturing, importance is placed on quality control.

Distribution of U. S. Divers' underwater diving equipment is made primarily through independent diving specialty shops. Sales are also made to sporting goods stores and jobbers. U. S. Divers actively supports a large number of underwater sport diving training programs. U. S. Divers is the largest supplier of personal diving equipment to the U. S. Navy. Such military sales represent approximately 6% of U. S. Divers' sales.

U. S. Divers has the exclusive North American rights, under a royalty agreement with a subsidiary of L'Air Liquide, to manufacture and market the *Aqua-Lung*® line of self-contained underwater breathing apparatus (see "Certain Transactions"). Captain Jacques Cousteau, Chairman of the Board of U. S. Divers, was instrumental in the development of the original *Aqua-Lung*® equipment, and other current improvements, designed in connection with his underwater research.

U. S. Divers also manufactures and distributes personal life support equipment for fire fighting and industrial safety applications. This equipment includes breathing apparatus sold under the name *Surviveir*® and fire retardant clothing. Recent governmental regulations, including the United States Occupational Safety and Health Act of 1970, have resulted in increased demand for many types of industrial safety equipment.

In addition to its own research, U. S. Divers participates with L'Air Liquide in an active research and development program in the fields of underwater equipment and safety, such as high pressure extra lightweight underwater and surface breathing systems (see "Certain Transactions"). U. S. Divers' principal manufacturing plant and executive offices are located in Santa Ana, California.

Research and Development

The Company has access to all of the research relevant to its business performed by L'Air Liquide throughout the world and to all relevant patents held by L'Air Liquide (see "Certain Transactions"). L'Air Liquide employs approximately 600 persons in the areas of research and development, 140 of whom are professionals. During each of the last two fiscal years, L'Air Liquide's expenditures for research and development were in excess of $11,000,000.

In addition to the research assistance provided by L'Air Liquide, the Company maintains a small research and development staff of 39 persons whose activities are primarily company sponsored and directed toward the adaptation for customers' use of processes developed by L'Air Liquide. The Company itself has developed two major processes employing industrial gases in the field of metallurgy. The first, Oxygen Bottom Metallurgy, was developed in 1968 by the Company in conjunction with, and is patented by, a steel company in West Germany. The process involves the injection of pure oxygen through the bottom of the steelmaking vessel as opposed to the top blowing oxygen steelmaking process now in use. This process, which has been successfully used in Europe, has recently been introduced by the United States

Steel Corporation at two of its plants. The other, designated as the Gazal process and patented by L'Air Liquide, is a means of reducing inclusions in, and homogenizing the temperatures of, molten steel and non-ferrous metals. The Company receives royalties from the use of these developments. For fiscal 1971 and 1972 research expenditures by the Company were approximately $650,000 and $850,000, respectively.

Because of the essential role played by oxygen in sustaining biological life and its activity in chemical reactions, oxygen is being increasingly used in the regeneration of polluted water in lakes, streams and rivers and in the oxidation of poisonous effluents and airborne pollutants. The Company and L'Air Liquide are therefore devoting considerable research effort to developing pollution control technologies and have research and development activities in the areas of oxygen regeneration of polluted industrial and municipal water, the bleaching of wood pulp, and the oxidation of sulfur dioxide in gases produced by the combustion of oil and coal. In addition, because of the growing cost of energy, L'Air Liquide and the Company are developing further uses of flame enrichment techniques for energy intensive combustion processes.

L'Air Liquide is currently engaged in research to develop applications for the freezing properties of liquid nitrogen. It has established testing and pilot plant facilities to study customer problems on a semi-industrial scale.

These research and development areas may represent significant new uses for oxygen and nitrogen; however, no assurance can be given that these efforts will be successful or that if successful the Company will benefit materially.

Property

The Company's principal offices and certain of its administrative and other premises, including the land situated under two air separation plants, are held subject to long term leases expiring on various dates between 1980 and 1988 and subject to renewal. All of the Company's plants and other buildings are owned by the Company in fee. Certain plants and buildings, carried at a depreciated cost of $5,447,000, are held subject to mortgages securing debt which aggregated approximately $3,584,000 at December 31, 1972. The Company regularly purchases cylinders on a conditional sales basis for the storage and delivery of industrial gases (see "Capitalization").

The Company's air separation plants are described under "Industrial Gases—Production" and the locations of the principal air separation plants are indicated on the map on the inside cover.

The Company's air separation plants and other manufacturing facilities are in good repair and are believed to be adequate for its present requirements. The Company owns unimproved land or options to purchase unimproved land adjacent to many of its existing plants which are available for the expansion of such plants.

Competition

The industrial gas business is highly competitive, with the principal competitive factors being price and efficient service.

In Canada, the Company is the largest producer of industrial gases and has, in the heavily industrialized area of Hamilton, Ontario, one of the largest air separation facilities in North America. In the United States, the Company's industrial gas operations are concentrated in areas outside of the heavily industrialized eastern and midwestern regions, which regions represent the largest markets for industrial gases. However, in those areas of the United States where it operates, considered as a whole, the Company believes that it is among the leading producers of industrial gases. In the United States there are four producers of industrial gases who operate on a nationwide basis and whose sales of industrial gases are greater than those of the Company.

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Welding equipment and supplies are generally sold by the Company through the same network of regional sales offices and distributors which services the industrial gas market. This network is an important element in the timely servicing of customers for such equipment and supplies. Competition in this field is primarily based upon price, service and technical assistance. In Canada the Company is the largest manufacturer of welding products. In the United States it is a leading distributor in its marketing areas for the welding products of a number of major manufacturers, although it experiences competition from numerous other distributors whose sales of welding products in general are greater than those of the Company.

Although U.S. Divers also experiences competition, it has maintained its leading position in the manufacture and distribution of underwater diving equipment in the United States since Jacques Cousteau, a founder of U.S. Divers, pioneered the development of the *Aqua Lung*® line of equipment in the early 1950's.

Government Regulation

The operations of the Company in the United States are governed by Phase IV of the Economic Stabilization Program. The Phase IV regulations provide, among other things, that a firm can increase prices on a dollar-for-dollar basis above those which prevailed during a designated base period to reflect increases in allowable costs, as defined, so long as the firm satisfies the profit margin test described below. The profit margin test requires that such firm's pre-tax profit margin for the current fiscal year not exceed the firm's base period profit margin. The base period profit margin is the weighted average of the profit margins for any two of the five fiscal years ending after August 15, 1968. Currently, the Company's profit margin exceeds the applicable base period profit margin. Thus, except for price increases which will raise prices to the higher of the base price or adjusted freeze price levels, the Company is unable to increase prices during the remainder of 1973. While the Company believes that these Economic Stabilization Program regulations have not materially affected the Company's operations, it is unable to predict the effect of these controls as they may be modified or applied in the future.

The Federal Trade Commission is presently conducting an investigation concerning the industrial gas industry in the United States, and a similar investigation concerning the welding supplies industry is being conducted in the Province of British Columbia, pursuant to the Combines Investigation Act of Canada. The Company is unable to predict the outcome of these inquiries at the present time; however, in the opinion of the management of the Company and Messrs. Coudert Brothers, United States counsel for the Company, and Messrs. Ogilvy, Cope, Porteous, Hansard, Marler, Montgomery & Renault, Canadian counsel for the Company, there should be no material adverse consequences to past or future operations resulting therefrom.

Employee Relations

The Company employs approximately 2,600 persons, of whom approximately 700 are represented by various collective bargaining groups under separate union contracts which are subject to renegotiation every two and three years.

For over two years the Company has been experimenting with a reorganized work week for plant and office employees. Currently at five plants, two of which are unionized, employees are working three to four day weeks with each employee averaging forty hours a week over a three-week period. Flexible working hours have also been implemented for some groups of office employees. Based on the results of the reorganized work week to date, management plans to continue this program.

Apart from one strike of eight weeks duration in 1969 primarily affecting its welding products plants, the Company has not experienced any material work stoppage and considers its employee relations to be good.

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MANAGEMENT

Directors and Executive Officers

The directors and executive officers of the Company are:

Name and Home Address	Age	Office	Director Since	Principal Occupation
Jean Henri Delorme 1, Av. du Maréchal Maunoury 75 Paris 16e, France	70	Chairman of the Board	1973	President and General Manager of L'Air Liquide
Pierre Alcée Salbaing 55 Belvedere Place Westmount, Quebec	59	President, Chief Executive Officer and Director	1972	
William Eric Dempster 1225 Gough Street San Francisco, California	49	Executive Vice President and Director	1972	
Mike Velimir Breber 15 Jordan Place Roxboro, Quebec	47	Vice President and Director	1972	President of M. V. Breber & Associates, Inc., Management Consultants
Ward James Sheridan 518 Parrott Drive San Mateo, Calif.	43	Secretary-Treasurer		
Jean Pierre Joseph Pineau 13 Rue Bonaparte Paris 6e, France	52	Director	1973	Executive Vice President, L'Air Liquide
Emilio Anthony Dominianni 5 Spring Lake Drive East White Plains, New York	42	Director and Assistant Secretary	1970	Partner, Coudert Brothers
Donald Ross Gant Youngs Road Basking Ridge, New Jersey	45	Director	1973	Partner, Goldman, Sachs & Co.
Jacques Gaston Maisonrouge 47 Masterton Road Bronxville, New York	49	Director	1973	President, IBM World Trade Corporation
Howell Eugene McBrayer 54 Mill Hill Road Southport, Connecticut	41	Director	1972	President, Exxon Enterprises Inc.
Colin Wesley Webster 52 Gordon Crescent Westmount, Quebec	70	Director	1973	Vice Chairman, Canadian Fuel Marketers Ltd.

The principal occupations of the officers have been as executives of the Company for the past five years with the exception of Messrs. Delorme and Breber whose principal occupations have been as listed above for at least the past five years. Mr. Breber, through M. V. Breber & Associates, Inc., has participated in the management of the Company for more than the past five years. The principal occupations of the directors have been as executives or partners of their present firms for at least the past five years.

The one-year term of office of each director expires at the next annual meeting of stockholders which is expected to be held in the spring of 1974, and officers will be elected on the same date.

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Remuneration

The following table sets forth the aggregate direct remuneration paid by the Company and its subsidiaries, as well as amounts set aside under pension plans, during the fiscal year ended December 31, 1972 to (i) each director, and each of the executive officers, of the Company whose direct aggregate remuneration exceeded $40,000, and (ii) all directors and officers of the Company as a group.

Name	Capacities in Which Remuneration Was Received	Aggregate Direct Remuneration	Estimated Annual Benefits Upon Retirement
Jean H. Delorme.....	Chairman of the Board of Canadian Liquid Air Ltd.	$50,625(1)	–0–
Pierre A. Salbaing.....	President of Canadian Liquid Air Ltd. and Chairman of the Board of Liquid Air Inc.	$92,982	$35,667
William E. Dempster.....	President of Liquid Air Inc.	$70,499(2)	$19,264
Ward J. Sheridan.....	Executive Vice President, Liquid Air Inc.	$40,500(2)	$10,419
All directors and officers as a group (11 persons)(3)		$262,769	$65,350

(1) Includes $30,255 for representation expenses.

(2) Under employment agreements with Liquid Air Inc., a subsidiary of the Company, terminating on March 27, 1974 and August 20, 1975, respectively, Mr. Dempster and Mr. Sheridan receive annual salaries of not less than $55,000 and $32,000, respectively, for services in their executive capacities.

(3) The aggregate direct remuneration paid by the Company to the directors and officers for the nine months ended September 30, 1973 was $218,796.

See "Certain Transactions" with respect to indirect remuneration to Mike V. Breber and Emilio A. Dominianni.

CERTAIN TRANSACTIONS

Under an agreement between Canadian Liquid Air Ltd. ("CLA") and L'Air Liquide, entered into in 1969 and extended in March 1973 to 1993, L'Air Liquide has granted CLA, for use in North America, access to all of its relevant technology and licenses to those of its patents and trademarks relevant to CLA's business. In return, CLA pays a technical fee of 3% of net sales in Canada. The fees paid under this agreement during the past three years amounted to $1,250,000 in 1970, $1,372,000 in 1971, and $1,648,000 in 1972.

In 1966, U. S. Divers entered into a technical agreement terminating December 31, 1977, with a subsidiary of L'Air Liquide, providing for the licensing to U. S. Divers of certain patents and trademarks on an exclusive basis in North America in return for a royalty of 2½% of net sales, with a minimum

annual royalty of $50,000, but otherwise not to exceed 50% of U. S. Divers' yearly net profits. Royalties paid under this agreement amounted to $50,000 in 1970, $241,000 in 1971 and $309,009 in 1972.

Pursuant to an agreement dated June 1, 1969 between the Company and AL E. & C. Ltd. ("ALEC"), a wholly-owned subsidiary of L'Air Liquide, ALEC has performed engineering and construction services for the Company and has received aggregate payments of $7,366,000 in 1970, $5,258,000 in 1971 and $2,797,000 in 1972 primarily for the construction of a 1200 ton per day air separation unit at its plant in Hamilton, Ontario. These services have been provided at cost (including a reasonable allowance for administrative and other overhead), plus 5%. ALEC has, pursuant to the same agreement, purchased management and consulting services and leased office space from the Company during the past three years for an annual fee of $101,000. In addition to the foregoing, the Company also purchases from time to time various goods and services from L'Air Liquide and certain of its subsidiaries, affiliates and Canadian Helium Limited in which L'Air Liquide has a one-third interest. These purchases aggregated $420,000 in 1970, $397,000 in 1971 and $563,000 in 1972.

The reorganization of the Company was accomplished pursuant to an agreement dated as of June 30, 1972 (the "Reorganization Agreement"), among the Company, L'Air Liquide, certain subsidiaries of L'Air Liquide, Exxon Enterprises Inc. and others. Pursuant to the Reorganization Agreement, L'Air Liquide transferred its 100% common stock interest in Canadian Liquid Air Ltd. to the Company in return for the issuance of 4,199,811 shares of the Company's Common Stock. In addition, the Company acquired 218,958 shares of Liquid Air Inc. from Canadian Liquid Air Ltd. for cash and notes. The remaining 39,182 outstanding shares of Liquid Air Inc. were acquired from American Air Liquide Inc., a wholly-owned subsidiary of L'Air Liquide, and Messrs. Salbaing, Dempster and Breber and M. V. Breber & Associates, Inc. in exchange for shares of the Company's Common Stock. Under this exchange American Air Liquide Inc. received 260,610 shares, Messrs. Salbaing and Dempster each received 13,387½ shares, Mr. Breber received 8,046½ shares and M. V. Breber & Associates, Inc. received 5,341 shares. The Company also acquired all of the outstanding shares of U. S. Divers in exchange for 403,844 shares of the Company of which an aggregate of 380,779 shares were received by subsidiaries of L'Air Liquide. In addition, in connection with the Reorganization Agreement, 190,000 convertible preferred shares of Canadian Liquid Air Ltd. were purchased by that corporation for cancellation from Exxon Enterprises Inc. for $19,000,000 and Exxon Enterprises Inc. purchased 190,000 shares of Convertible Preferred Stock of the Company for $19,000,000.

The Reorganization Agreement also provided that none of the fees and royalties payable by the Company pursuant to the agreements with L'Air Liquide referred to above would be increased and that services performed for the Company by L'Air Liquide, its subsidiaries and affiliates, including the services performed by ALEC as mentioned above, would continue to be provided at cost (including a reasonable allowance for administrative and other overhead), plus 5%. The above provisions terminate when Exxon Enterprises Inc., a party to the Reorganization Agreement, no longer owns 50% of its initial stock interest in the Company which it acquired pursuant to the Reorganization Agreement, or on December 31, 1981, whichever first occurs.

Pursuant to the Reorganization Agreement, American Air Liquide Inc. loaned the Company $8,000,000, bearing interest at 8½% and payable five years from October 12, 1972 (see Note D to the Financial Statements). In addition, American Air Liquide Inc. has loaned U. S. Divers $480,000 and $250,000, bearing interest at 8½% and 9½% payable on December 24, 1973 and on demand, respectively. All of the above loans are unsecured. American Air Liquide Inc. has also agreed to lend the Company $3,500,000, representing a portion of the proceeds to be received from the shares being sold by it hereunder, bearing interest at 8½% payable October 11, 1977.

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Pursuant to an agreement dated December 15, 1972, among the Company, Dye Oxygen Company, American Air Liquide Inc. and others, providing for the acquisition of Dye, the Company issued 516,530 shares of its Common Stock to the stockholders of Dye, including 90,471½ shares issued to American Air Liquide Inc., which had owned approximately 17.5% of the outstanding stock of Dye.

In connection with the special dividend of $.55 per share paid on October 29, 1973, L'Air Liquide and its subsidiaries have agreed to reinvest such dividend by purchasing, on the day prior to the date of this Prospectus, 115,000 shares of the Company's Common Stock, at the price per share being received by the Company from the Underwriters for the shares being offered hereby.

M. V. Breber & Associates, Inc., a Canadian corporation of which M. V. Breber, Vice President and a director of the Company, is the President and sole stockholder, has provided consulting services to the Company for which it received aggregate remuneration of $34,349 in 1970, $38,918 in 1971 and $46,509 in 1972. Mr. Breber became a Vice President of the Company in October 1972.

Coudert Brothers, a law firm of which E. A. Dominianni, a director of the Company, is a partner, received aggregate remuneration for legal services performed for the Company of $39,855 in 1970, $18,790 in 1971 and $30,025 in 1972.

PRINCIPAL STOCKHOLDERS

The following table sets forth as of September 30, 1973 the number of shares of capital stock of the Company owned of record or beneficially directly or indirectly by (a) each person who owned of record, or is known by the Company to have owned beneficially, more than 10% of the Common or Preferred Stock of the Company and (b) all directors and officers of the Company as a group.

Name and Address	Title of Class	Type of Ownership	Amount Owned	Percent of Class
L'Air Liquide	Common	Record and Beneficial	4,253,655	71.9 %
75 Quai d'Orsay				
Paris, France		Beneficial*	720,566	12.2 %
Exxon Enterprises Inc.	Preferred	Record and Beneficial	190,000	100 %
1251 Avenue of the Americas				
New York, N. Y.				
All directors and officers as a group (11 persons)	Common	Record and Beneficial	36,435	0.6 %
		Beneficial	5,341	0.01%

* Owners of record are subsidiaries of L'Air Liquide.

Directors and officers as a group also owned beneficially as of September 30, 1973, 37,932 shares of capital stock of L'Air Liquide amounting to approximately .5% of such class of shares.

After giving effect to the offering made hereby and the purchase of certain shares through reinvestment of dividends (see "Certain Transactions"), L'Air Liquide and its subsidiaries will own 78.3% of the outstanding Common Stock of the Company. After giving effect to the offering made hereby and the purchase of certain shares through reinvestment of dividends (see "Certain Transactions"), and assuming conversion of the remaining Convertible Preferred Stock by Exxon Enterprises Inc., L'Air Liquide and its subsidiaries and Exxon Enterprises Inc. would own 67.7% and 13.6%, respectively, of such Common Stock. L'Air Liquide may be deemed a "parent" of the Company within the meaning of the Securities Act of 1933.

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SELLING STOCKHOLDERS

The following table lists the Selling Stockholders, the number of shares of the Company's Common Stock owned by each, the number to be offered and the number of shares to be owned by each after this offering:

Name	Amount Owned	Amount to be Offered	Amount to be Owned After Offering
June L. Alexander	1,095½	525	570½
Gilbert V. Dye and Ruth M. Dye	161,210	53,735	107,475
Gilbert V. Dye, Jr. and Joanne V. Dye Trustees, "Family Trust Schedule A"	31,804½	28,623	3,181½
Gilbert V. Dye, Jr. and Joanne V. Dye Trustees, "Family Trust Schedule B"	68,540½	20,543	47,997½
Eugene C. Guidry	1,890	1,400	490
Harley N. Hebert	7,364	3,759	3,605
Earl H. Hines	296,425½	145,925	150,500½
Earl H. Hines, Jr.	22,505	5,950	16,555
John D. Hines	50,393	2,965	47,428
William G. Hines	30,005½	8,099	21,906½
W. Ray Hines	30,611	5,162	25,449
Don W. Johnston	388½	350	38½
Dwight Portugal and Jeanne Portugal	19,190½	6,398	12,792½
Dorthy Ann Reilly	68,540½	13,601	54,939½
William P. Reilly and Dorthy Ann Reilly	31,804½	28,623	3,181½
American Air Liquide Inc.(1)	362,841½(2)	200,000	162,841½(2)
Exxon Enterprises Inc.(3)	35,675	35,675	0
Total	1,220,285	561,333	658,952

(1) A wholly owned subsidiary of L'Air Liquide (see "Principal Stockholders").

(2) Does not include 8,388 shares purchased on the day prior to the date of this Prospectus by American Air Liquide Inc. through reinvestment of dividends (see "Certain Transactions").

(3) These shares will be received upon conversion of 6,684 shares of Convertible Preferred Stock (see "Principal Stockholders"). Exxon Enterprises Inc. will retain 183,316 shares of Convertible Preferred Stock, which are convertible into 978,450 shares of Common Stock.

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DESCRIPTION OF CAPITAL STOCK

The authorized capital of the Company consists of 10,000,000 shares of Common Stock, no par value, and 190,000 shares of Preferred Stock, par value $100 per share. Stockholders have no pre-emptive rights. On all matters requiring a vote of stockholders, including the election of directors, each share of Common Stock is entitled to one vote. The Certificate of Incorporation of the Company does not provide for cumulative voting. Accordingly, the holders of more than 50% of the Common Stock voting for the election of directors can elect 100% of the directors if they choose to do so, in which event the holders of the remaining shares of Common Stock voting for the election of directors will not be able to elect any person or persons to the Board of Directors.

Subject to the prior rights of holders of Preferred Stock and to limitations on dividends and other restrictions as set forth below, the Common Stock is entitled to dividends as declared by the Board of Directors, has full and exclusive voting power, and is entitled to receive any distribution made to stockholders in liquidation.

All outstanding shares of Common Stock are fully paid and non-assessable.

Morgan Guaranty Trust Company, 23 Wall Street, New York, New York, is the transfer agent and registrar for the Common Stock of the Company. Montreal Trust Company is the transfer agent for the Common Stock in Canada at its principal offices in the cities of Montreal and Toronto.

The Company intends to furnish annual reports to its stockholders containing certified financial statements and quarterly reports containing unaudited statements of sales and earnings.

Each share of Preferred Stock is presently convertible into 5.3375 shares of Common Stock, subject to adjustment if certain dilutive events occur. From January 1, 1973 until December 31, 1976 the holders of Preferred Stock are entitled to dividends in an amount per share equal to that actually paid on the number and fraction of shares of Common Stock into which each share of Preferred Stock is convertible at the time of such payment. After December 31, 1976 the holders of Preferred Stock are entitled to dividends, payable quarterly, at the rate of $5.50 per share per annum. Such dividends are cumulative and must be paid in full prior to any dividend on the Common Stock. The Preferred Shares are redeemable from, and after, December 31, 1981 at par value plus accumulated dividends. Upon liquidation the holders of Preferred Stock are entitled to payment of $100 per share plus accrued dividends prior to any distribution to the holders of Common Stock. The holders of Preferred Stock have the right to elect two directors during any time that the dividend payments required to be paid after 1976 have been in arrears for four quarters. During any time that the consolidated net tangible assets of the Company are less than the aggregate par value of the shares of Preferred Stock then outstanding, such holders shall have the right to elect a majority of the directors. After giving effect to this offering, consolidated net tangible assets are estimated at $70,000,000 and the approximate par value of the outstanding Preferred Stock will be $18,332,000.

During the period that any shares of the Company's Preferred Stock are outstanding, the Company may not issue or incur any long-term debt unless, after giving effect thereto, (a) consolidated net income, as defined, of the Company for any specified 12 month period is at least three times the annual interest requirement on long-term debt plus one-third of the annual lease rentals on net rental obligations and (b) consolidated net tangible assets of the Company are at least equal to the amount of long-term debt. In addition, prior to January 1, 1977 the Company may not declare or pay any dividends on shares of its Common Stock if the aggregate of all such dividends declared since January 1, 1969 would exceed the consolidated net earnings of the Company since January 1, 1969. Pursuant to this provision approximately $6,6[illegible],000 was available for the payment of dividends at December 31, 1972.

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UNDERWRITING

The Underwriters named below, acting through their representatives, Goldman, Sachs & Co. and Lazard Frères & Co. (the "Representatives"), have severally agreed to purchase on November , 1973 the number of shares of Common Stock set forth below opposite their respective names.

Underwriter	Number of Shares
Goldman, Sachs & Co.	187,333
Lazard Frères & Co.	25,000
Advest Co.	4,000
*A. E. Ames & Co. Limited	12,000
Arnhold and S. Bleichroeder, Inc.	4,000
Robert W. Baird & Co. Incorporated	4,000
Bateman Eichler, Hill Richards Incorporated	4,000
Bear, Stearns & Co.	8,000
Sanford C. Bernstein & Co., Inc.	8,000
Birr, Wilson & Co., Inc.	2,000
Blaine & Company, Inc.	2,000
Blunt Ellis & Simmons Incorporated	4,000
Blyth Eastman Dillon & Co. Incorporated	12,000
Boettcher and Company	4,000
Bosworth, Sullivan & Company, Inc.	4,000
J. C. Bradford & Co., Incorporated	4,000
Branch, Cabell & Co.	2,000
Alex. Brown & Sons	8,000
Burgess & Leith	2,000
Butcher & Singer	4,000
The Chicago Corporation	4,000
Colin, Hochstin Co.	2,000
Cowen & Co.	2,000
Craigie, Mason-Hagan, Inc.	2,000
*Crang & Ostiguy Inc.	2,000
Dain, Kalman & Quail, Incorporated	4,000
*Dominion Securities Corporation Harris & Partners Limited	8,000
Drexel Burnham & Co. Incorporated	12,000
duPont Walston Incorporated	12,000
A. G. Edwards & Sons, Inc.	4,000
Edwards & Hanly	4,000
EuroPartners Securities Corporation	12,000
Fahnestock & Co.	4,000
The First Boston Corporation	12,000
First Investors Corporation	2,000
Foster & Marshall Inc.	2,000
*Greenshields Incorporated	12,000
Hayden Stone Inc.	8,000
Hornblower & Weeks-Hemphill, Noyes Incorporated	12,000
Howard, Weil, Labouisse, Friedrichs Incorporated	4,000
E. F. Hutton & Company Inc.	12,000
W. E. Hutton & Co.	8,000
Hugh Johnson & Company, Inc.	2,000
Johnston, Lemon & Co. Incorporated	4,000
Edward D. Jones & Co.	2,000
Kidder, Peabody & Co. Incorporated	12,000
Legg Mason/Wood Walker, Div. of First Regional Securities, Inc.	4,000

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Underwriter	Number of Shares
Lehman Brothers Incorporated	12,000
Lepercq, de Neuflize & Co. Incorporated	8,000
*Lévesque, Beaubien Inc.	4,000
Loewi & Co. Incorporated	4,000
Manley, Bennett, McDonald & Co.	4,000
McDonald & Company	4,000
*McLeod, Young, Weir & Company Limited	8,000
Merrill Lynch, Pierce, Fenner & Smith Incorporated	12,000
Mitchum, Jones & Templeton Incorporated	4,000
Moore, Leonard & Lynch, Incorporated	4,000
*Nesbitt Thomson Securities Limited	8,000
New York Hanseatic Corporation	4,000
Newhard, Cook & Co. Incorporated	4,000
The Ohio Company	4,000
Oppenheimer & Co.	8,000
Paine, Webber, Jackson & Curtis Incorporated	12,000
Parker/Hunter Incorporated	2,000
H. O. Peet & Co. Inc.	2,000
Piper, Jaffray & Hopwood Incorporated	8,000
*Pitfield, Mackay, Ross & Company Limited	8,000
Prescott, Ball & Turben	4,000
Rauscher Pierce Securities Corporation	4,000
Reynolds Securities Inc.	12,000
*Richardson Securities of Canada	[illegible]000
The Robinson-Humphrey Company, Inc.	4,000
L. F. Rothschild & Co.	8,000
Shields Securities Corporation	8,000
SoGen-Swiss International Corporation	12,000
Stifel, Nicolaus & Company Incorporated	2,000
Suez American Corporation	8,000
Sutro & Co. Incorporated	4,000
Thomson & McKinnon Auchincloss Kohlmeyer Inc.	8,000
Tucker, Anthony & R. L. Day	8,000
C. E. Unterberg, Towbin Co.	8,000
Wagenseller & Durst, Inc.	2,000
Warburg-Paribas, Inc.	12,000
Watling, Lerchen & Co. Incorporated	4,000
Wheat, First Securities, Inc.	4,000
Dean Witter & Co. Incorporated	12,000
Wood Gundy Incorporated	8,000
Total	736,533

* Canadian Underwriters

Each of the Underwriters is to purchase from the Company and each of the Selling Stockholders, respectively, that number of shares which bears the same proportion to the total number of shares to be sold by the Company and each of the Selling Stockholders as the total number of shares to be purchased by such Underwriter bears to the total number of shares to be purchased by all of the Underwriters.

Under the terms and conditions of the Underwriting Agreement, the Underwriters are committed to take and pay for all of the shares offered hereby if any are taken.

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There has been no previous market for the Common Stock of the Company. The major factors considered by the Company, the Selling Shareholders and the Representatives in determining the public offering price of the Common Stock, in addition to prevailing market conditions, are the price earnings multiples of publicly traded common stocks of similar companies, the growth rates and the earnings of the Company and similar companies in recent periods and the Company's earnings potential.

The Underwriters propose to offer the shares in part directly to retail purchasers at the initial public offering price as set forth on the cover page of this Prospectus, and in part to certain securities dealers, which may include Canadian dealers, at such price less a concession of cents per share. Such Underwriters may allow and such dealers may reallow a concession of not in excess of cents per share to certain brokers and dealers. After the shares are released for sale to the public; the offering price and other selling terms may from time to time be varied by the representatives, provided, however, that the offering price may not be increased above the initial public offering price.

The Representatives have informed the Company that they do not expect sales to discretionary accounts by the Underwriters to exceed 5% of the total number of shares of Common Stock offered hereby and that the sales to discretionary accounts by the Representatives will be less than 1.0% of the total number of shares of Common Stock offered hereby.

At the request of the Company the Underwriters have agreed to set aside a maximum of 25,000 shares for directed sales to persons having a business relationship with the Company.

The Selling Stockholders have agreed not to sell or otherwise dispose of any shares of the Company for a period of 90 days following the date of this Prospectus without the consent of the Representatives.

The Company has agreed to indemnify the several underwriters against certain civil liabilities, including liabilities under the Securities Act of 1933 and the securities legislation of the provinces of Canada in which the shares are being offered.

The obligations of all Underwriters under the Underwriting Agreement are subject to the fulfillment of certain requirements contained therein.

Donald R. Gant, a partner of Goldman, Sachs & Co., is a director of the Company.

LEGAL OPINIONS

The validity of the Common Stock offered hereby will be passed upon for the Company and American Air Liquide Inc. by Messrs. Coudert Brothers, New York, New York, for Exxon Enterprises Inc. by Francis J. Devlin, Esq., who is regularly employed as counsel for Exxon Corporation, of which Exxon Enterprises Inc. is a subsidiary, for certain of the other Selling Stockholders by Messrs. Snell & Wilmer, Phoenix, Arizona and Messrs. Fulbright, Crooker & Jaworski, Houston, Texas, and for the Underwriters by Messrs. Sullivan & Cromwell, New York, New York. In addition, certain matters of Canadian law will be passed upon by Messrs. Ogilvy, Cope, Porteous, Hansard, Marler, Montgomery & Renault, Montreal, Canada, for the Company, and by Messrs. Geoffrion and Prud'homme, Montreal, Canada, for the Underwriters. Emilio A. Dominianni, a Director and Assistant Secretary of the Company, is a partner of Coudert Brothers.

EXPERTS

The Company's auditors are Ernst & Ernst, independent public accountants, 140 Broadway, New York, New York. The audited financial statements included in this Prospectus and elsewhere in the Registration Statement and the related schedules included elsewhere in the Registration Statement have

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been examined by Ernst & Ernst; Price Waterhouse & Co.; Arthur Young & Company; Main Lafrentz & Co.; Campbell, Sharp, Nash & Field; and Michael J. DeBlanc, independent accountants, as indicated and to the extent set forth in the reports of such firms included herein and in the Registration Statement. Such financial statements and schedules are so included in reliance upon the reports of such accountants, given upon their authority as experts in auditing and accounting.

ADDITIONAL INFORMATION

This prospectus does not contain all of the information set forth in the Registration Statement and the exhibits and schedules thereto which the Company has filed with the Securities and Exchange Commission, Washington, D. C. under the Securities Act of 1933, as amended, and to which reference is hereby made.

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REPORT OF INDEPENDENT ACCOUNTANTS

Board of Directors,
Liquid Air Corporation of North America,
New York, New York.

We have examined the balance sheet of Liquid Air Corporation of North America and the consolidated balance sheet of Liquid Air Corporation of North America and its subsidiaries as of December 31, 1972 and the related statements of earnings and shareholders' equity and of changes in financial position for the three years (one year as to the Parent Company) then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We did not examine the financial statements of Canadian Liquid Air Ltd. and Canadian subsidiaries, nor U.S. Divers Co., all of which are consolidated subsidiaries, for the years 1970 and 1971, which financial statements reflect total revenues constituting 59% in 1970 and 58% in 1971, respectively, of the total consolidated revenues, nor did we examine the December 31, 1972 balance sheets of Gulf Oxygen Industries, Inc. and Dye Oxygen Company, consolidated herein, which reflect total assets constituting 9% of the consolidated total. These statements were examined by other independent accountants whose reports thereon have been furnished to us and our opinion expressed herein, insofar as it relates to such amounts included for Canadian Liquid Air Ltd. and Canadian subsidiaries, U.S. Divers Co., Gulf Oxygen Industries, Inc. and Dye Oxygen Company, is based solely upon the reports of the other auditors.

In our opinion, based upon our examination and the reports of other auditors, the accompanying balance sheets and statements of earnings and shareholders' equity and of changes in financial position present fairly the financial position of Liquid Air Corporation of North America and the consolidated financial position of Liquid Air Corporation of North America and subsidiaries at December 31, 1972 and the respective results of their operations, changes in shareholders' equity and changes in financial position for the three years (one year as to the Parent Company) then ended, in conformity with generally accepted accounting principles consistently applied.

For the two years ended December 31, 1969, the consolidated statements of earnings represent the combination of the statements of Canadian Liquid Air Ltd. and Canadian subsidiaries, U.S. Divers Co. and (beginning August 1, 1969) American Cryogenics, Inc., all of which were examined by other auditors whose reports are included herein. In our opinion, the amounts included in the statements of consolidated earnings for the two years ended December 31, 1969, have been properly compiled from the amounts included in the statements (not separately included herein) covered by the reports of other auditors.

ERNST & ERNST

New York, N. Y.,
February 26, 1973 except
that as to Note E the
date is March 28, 1973

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REPORT OF INDEPENDENT ACCOUNTANTS

The Board of Directors,
Canadian Liquid Air Ltd.

We have examined the consolidated balance sheet of Canadian Liquid Air Ltd. and its Canadian subsidiaries as of December 31, 1968, 1969, 1970 and 1971 and the related consolidated statements of earnings and retained earnings for the four years ended December 31, 1971. Our examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as we considered necessary in the circumstances.

In our opinion, the aforementioned statements, not presented separately herein, present fairly the consolidated financial position of the Company and its Canadian subsidiaries as at December 31, 1968, 1969, 1970 and 1971 and the consolidated results of their operations for the four years ended December 31, 1971, in accordance with generally accepted accounting principles applied on a consistent basis.

CAMPBELL, SHARP, NASH & FIELD
Chartered Accountants

Montreal, Quebec.
March 1, 1972.

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REPORTS OF INDEPENDENT ACCOUNTANTS

Board of Directors
Liquid Air Inc. (Formerly American Cryogenics, Inc.)

We have examined the consolidated statements of operations and deficit of American Cryogenics, Inc. and subsidiaries for the five months ended December 31, 1969. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, such financial statements (not presented separately herein) present fairly the results of operations of American Cryogenics, Inc., and subsidiaries for the five months ended December 31, 1969, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding period.

MAIN LAFRENTZ & CO.

Atlanta, Georgia
March 10, 1970

The Board of Directors
U. S. Divers Co.

We have examined the statement of operations and deficit of U. S. Divers Co. for the four years ended September 30, 1971 and the related statement of changes in financial position for the two years ended September 30, 1971. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the statements mentioned above (not presented separately herein) present fairly the results of operations of U. S. Divers Co. for the four years ended September 30, 1971 and the changes in financial position for the two years ended September 30, 1971, in conformity with generally accepted accounting principles applied on a consistent basis during the periods.

ARTHUR YOUNG & COMPANY

Santa Ana, California
November 24, 1971

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LIQUID AIR CORPORATION OF NORTH AMERICA
AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

ASSETS

	December 31, 1972	June 30, 1973 (Unaudited)
	(Thousands of Dollars)	
CURRENT ASSETS:		
Cash	$ 2,075	$ 1,646
Certificates of deposit and short-term securities—at cost (which approximates market)	6,068	6,300
Receivables—		
Trade, less allowances ($926,000 at December 31; $1,032,000 at June 30)	23,672	30,296
Other	51	1,157
Inventories at lower of cost or market—Note B	20,129	20,978
Prepaid expenses and deposits	1,026	1,002
Total current assets	54,421	61,379
INVESTMENTS AND OTHER ASSETS:		
Loans	714	1,161
Other	1,462	1,550
	2,176	2,711
PROPERTY, PLANT AND EQUIPMENT, at cost—Notes C and D	125,203	132,815
Less accumulated depreciation and amortization	50,231	53,831
	74,972	78,984
INTANGIBLES:		
Cost in excess of net assets of consolidated subsidiaries—less amortization	16,247	16,235
	$147,816	$159,309

See notes to financial statements.

CX-335-2-21

LIQUID AIR CORPORATION OF NORTH AMERICA AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

LIABILITIES AND SHAREHOLDERS' EQUITY

	December 31, 1972	June 30, 1973 (Unaudited)
	(Thousands of Dollars)	
CURRENT LIABILITIES:		
Bank indebtedness	$ 6,647	$ 12,270
Accounts payable	13,292	12,362
Accrued interest	516	922
Accrued taxes, other than income taxes	755	846
Due to L'Air Liquide and other affiliates	1,667	1,839
Income taxes	1,877	2,795
Current maturities of long-term debt	2,871	3,916
Total current liabilities	27,625	34,950
LONG-TERM DEBT (exclusive of current maturities)—Note D	36,049	35,252
DEFERRED INCOME TAXES	4,790	5,535
SHAREHOLDERS' EQUITY:		
Capital stock—Notes E and F		
Preferred shares, convertible, par value $100 Authorized and issued 190,000 shares	19,000	19,000
Common shares, no par value		
Authorized 10,000,000 shares		
Issued 5,914,944 shares at stated value	17	17
Paid-in capital	53,023	53,023
Retained earnings—Note F	7,312	11,532
	79,352	83,572
COMMITMENTS AND CONTINGENCIES—Notes G, H and I	$147,816	$159,309

See notes to financial statements.

Approved by the Board of Directors:

(Signed) PIERRE A. SALBAING, *Director*

(Signed) MIKE V. BREBER, *Director*

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CX-335-2-22

LIQUID AIR CORPORATION OF NORTH AMERICA AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY

	Shares	Years Ended December 31, 1968	1969	1970	1971	1972	Six Months Ended June 30, 1973
		(Thousands of Dollars)					(Unaudited)
SUBSIDIARIES' COMBINED CAPITAL STOCKS:							
Balance—beginning of year		$21,799	$22,604	$44,840	$49,340	$49,840	
Common shares issued to L'Air Liquide for cash		805	3,236	4,500	500		
Preferred shares							
Issued to acquire subsidiary			19,000				
Purchased for cash						(19,000)	
Adjustment for 1972 reorganization—Note A						(30,840)	
Balance—end of year		$22,604	$44,840	$49,340	$49,840	$ —	
L'AIR LIQUIDE INTEREST IN LIQUID AIR INC:							
Interest acquired in 1969						$ 3,433	
Adjustment for 1972 reorganization Note A						(3,433)	
						$ —	
PARENT CAPITAL STOCK:							
Preferred shares issued for cash	190,000					$19,000	
Balance—end of period	190,000					$19,000	$19,000
Common shares issued:							
—on reorganization	4,904,427½					$ 14	
—to L'Air Liquide for cash	53,844					—	
—to acquire subsidiaries	956,672½					3	
Balance—end of period	5,914,944					$ 17	$ 17
PAID-IN CAPITAL:							
On issue of common shares:							
—on reorganization						$34,259	
—to L'Air Liquide for cash						1,000	
—to acquire subsidiaries						17,764	
Balance—end of period						$53,023	$53,023
RETAINED EARNINGS:							
Balance—beginning of period		$ 513	$ 1,310	$ 1,443	$ 1,868	$ 3,375	$ 7,312
Net earnings		3,212	2,521	3,153	4,592	7,994	6,293
Cash dividends—common		(2,415)	(2,388)	(2,728)	(3,085)	(4,063) (1)	(1,774)
Cash dividends—preferred							(304)
Net earnings of a consolidated subsidiary for three months ended December 31, to conform to December 31st year end						6	
Balance—end of period		$ 1,310	$ 1,443	$ 1,868	$ 3,375	$ 7,312 (2)	$11,532 (2)

( ) Denotes deduction.

	(000's)
(1) Paid to common shareholders ($.52 per share on 4,904,427½ shares)	$2,550
Paid by a subsidiary prior to reorganization	1,513
	$4,063

(2) A separate statement of Parent Company shareholders' equity is not considered necessary as all information that would be included therein is reflected above. Retained earnings includes $3,336,000 at December 31, 1972 ($13,038,000 at June 30, 1973) of undistributed earnings of subsidiaries.

See notes to financial statements.

CX-335-2-23

LIQUID AIR CORPORATION OF NORTH AMERICA AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CHANGES IN FINANCIAL POSITION

	Years Ended December 31,			Six Months Ended June 30,
	1970	1971	1972	1973
	(Thousands of Dollars)			(Unaudited)
SOURCE OF FUNDS:				
Current operations:				
Net earnings	$ 3,153	$ 4,592	$ 7,994	$ 6,298
Expenses not requiring current cash outlays:				
Depreciation	5,607	5,893	6,770	3,987
Amortization of intangibles				78
Deferred income taxes	763	953	913	745
Total from operations	9,523	11,438	15,677(1)	11,108
Additional long-term debt	6,704	1,701	17,784	2,049
Preferred shares, issued for cash			19,000	
Common shares issued for cash	4,500	500	1,000	
Common shares issued in exchange for shares of companies acquired			17,767	
Sale of fixed assets	426	267	435	348
Net earnings of a subsidiary for three months			6	
Total Source	$21,153	$13,906	$71,669	$13,505
DISPOSITION OF FUNDS:				
Net value of non-current assets of subsidiaries acquired			8,515(2)	
Additions to fixed assets	13,150	11,802	10,428	8,347
Additions to intangibles	59	7	6,573	66
Increase in investments	155	65	579	535
Repayment of long-term debt	5,538	7,297	8,630	2,846
Cash dividends	2,728	3,085	4,063	2,078
Purchase of Subsidiary's preferred shares for cancellation			19,000	
Total Disposition	$21,630	$22,256	$57,788	13,872
INCREASE (DECREASE) IN WORKING CAPITAL	$ (477)	$(8,350)	$13,881	$ (367)
CHANGES IN COMPONENTS OF WORKING CAPITAL:				
Increase (decrease) in current assets:				
Cash and marketable securities	(1,508)	(3,776)	6,918	(797)
Receivables	659	1,243	5,786	6,930
Inventories	178	227	5,724	849
Prepaid expenses	(45)	450	(331)	(24)
	(716)	(1,856)	18,097	6,958
Increase (decrease) in current liabilities:				
Bank indebtedness	829	3,990	1,003	5,623
Accounts payable and accrued	(1,095)	438	5,424	(433)
Due to L'Air Liquide and other affiliates	20	(219)	(1,438)	172
Income taxes	10	(33)	1,534	918
Current maturity of long-term debt	(3)	2,268	(2,307)	1,045
	(239)	6,494	4,216	7,325
INCREASE (DECREASE) IN WORKING CAPITAL	$ (477)	$(8,350)	$13,881	$ (367)

(1) Excludes the total from operations of Gulf and Dye reported on their income statements as $2,715,000. All other figures include the effect of consolidating the balance sheets of these subsidiaries acquired as of December 31, 1972.

(2) The non-current accounts of subsidiaries acquired at December 31, 1972 are summarized as follows:

Property, plant and equipment	$10,084
Other assets	52
Long-term debt	(1,621)
	$ 8,515

See notes to financial statements.

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CX-335-2-24

LIQUID AIR CORPORATION OF NORTH AMERICA
(Parent Company)

BALANCE SHEETS

ASSETS

	December 31, 1972	June 30, 1973 (Unaudited)
	(Thousands of Dollars)	
CURRENT ASSETS:		
Cash	$ 6	$ 71
Recoverable income taxes		138
Prepaid expenses		51
	6	260
INVESTMENTS—Shares of wholly-owned subsidiaries at equity in net assets (eliminated in consolidation)	75,438	80,759
INTANGIBLES—Cost in excess of net assets of wholly-owned subsidiaries —less amortization	16,247	16,235
	$91,691	$97,254

LIABILITIES AND SHAREHOLDERS' EQUITY

CURRENT LIABILITIES:		
Bank indebtedness	$ 3,830	$ 5,020
Accounts payable	293	4
Accrued interest	216	658
	4,339	5,682
LONG-TERM DEBT—Note D	8,000	8,000
SHAREHOLDERS' EQUITY:		
Capital stock—Notes E and F		
Preferred shares, convertible, par value $100		
Authorized and issued 190,000 shares	19,000	19,000
Common shares, no par value		
Authorized 10,000,000 shares		
Issued 5,914,944 shares at stated value	17	17
Paid in capital	53,023	53,023
Retained earnings—Note F	7,312	11,532
	79,352	83,572
COMMITMENTS AND CONTINGENCIES—Notes G, H and I		
	$91,691	$97,254

See notes to financial statements.

A 4950

CX-335-2-25

LIQUID AIR CORPORATION OF NORTH AMERICA
(Parent Company)

STATEMENTS OF EARNINGS

	Year Ended December 31, 1972	Six Months Ended June 30, 1973 (Unaudited)
	(Thousands of Dollars)	
INCOME:		
Earnings of subsidiaries of which $1,800,000 in 1972 and $1,549,000 in 1973 were received as dividends	$8,268	$6,901
EXPENSES:		
Interest expense	215	509
Amortization of intangibles		78
Legal fees	47	14
Other	12	5
	274	606
	7,994	6,295
INCOME TAXES:		
U.S. tax credit due to filing consolidated tax return—Note		(253)
Canadian withholding taxes on dividends—see Note (6) to Consolidated Statements of Earnings		250
		(3)
Net Earnings	$7,994	$6,298

Note—The statement of earnings of the Parent for the year ended December 31, 1972, reflects the earnings of the constituent companies for the entire year, as they were under the common control of L'Air Liquide—see Note A. The Company files a consolidated federal income tax return with its United States subsidiaries and appropriate provisions for income taxes have been made in the subsidiaries' accounts. No tax credit was allocated to the Parent Company for 1972.

See notes to financial statements.

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CX-35-2-26

LIQUID AIR CORPORATION OF NORTH AMERICA

(Parent Company)

STATEMENTS OF CHANGES IN FINANCIAL POSITION

	Year Ended December 31, 1972	Six Months Ended June 30, 1973 (Unaudited)
	(Thousands of Dollars)	
SOURCE OF FUNDS:		
Net earnings	$ 7,994	$ 6,298
Undistributed earnings of subsidiaries (deduction)	(4,956)	(5,352)
Amortization of intangibles		78
Total from operations	3,038	1,024
Long-term note issued to affiliate	8,000	
Capital stock issued in reorganization:		
Preferred, for cash	19,000	
Common, to acquire subsidiaries	37,648	
Common shares issued to L'Air Liquide for cash	1,000	
Common shares to acquire purchased subsidiaries	17,767	
Total Source	86,453	1,024
DISPOSITION OF FUNDS:		
Investments in subsidiaries	85,723	(31)
Increase in intangibles		66
Dividends paid:		
By the Company	2,550	2,078
By subsidiary prior to reorganization	1,513	
Total Disposition	90,786	2,113
DECREASE IN WORKING CAPITAL	$ 4,333	$ 1,089
INCREASE (DECREASE) IN WORKING CAPITAL BY COMPONENT:		
Cash	$ 6	$ 65
Recoverable income taxes		138
Prepaid expense		51
Bank indebtedness	(3,830)	(1,190)
Accounts payable	(293)	289
Accrued interest	(216)	(442)
DECREASE IN WORKING CAPITAL	($ 4,333)	($ 1,089)

See notes to financial statements.

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CX-35-2-27

LIQUID AIR CORPORATION OF NORTH AMERICA AND SUBSIDIARIES

NOTES TO FINANCIAL STATEMENTS

Note A—Accounting Principles:

Basis of Presentation of Consolidated Financial Statements

Pursuant to a plan of reorganization in 1972, Liquid Air Corporation of North America (a subsidiary of L'Air Liquide, Société Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude) acquired substantially all of L'Air Liquide's North American subsidiaries. The reorganization has been accounted for similar to a pooling of interests, in that the accounting bases of the assets and liabilities of the constituent companies have been carried forward, and the consolidated statement of earnings includes the operations of the constituent companies for the periods during which they were under the common control of L'Air Liquide. Such constituent companies and the periods for which their financial statements are included are as follows:

Subsidiary	Period Included
Canadian Liquid Air Ltd. and its Canadian subsidiaries	5 Years ended December 31, 1972
U. S. Divers Co.	5 years ended September 30, 1972*
Liquid Air Inc. (formerly named American Cryogenics, Inc.) (this United States company was owned by Canadian Liquid Air Ltd. (85%) and L'Air Liquide (15%) from date of purchase until the 1972 reorganization)	August 1, 1969 (effective date of purchase) to December 31, 1972
Industrial Air Products Co. and its subsidiaries (since August 1, 1969, United States subsidiaries of Liquid Air Inc.)	August 1, 1969 (effective date of purchase) to December 31, 1972

* Fiscal years ended September 30 have been combined with those of other companies ended December 31. Net income for the three month period ended December 31, 1972 has been credited to retained earnings (net sales for this period were $2,434,000).

Gulf Oxygen Industries, Inc. and Dye Oxygen Company, acquired by the Company as of December 31, 1972, in exchange for 956,672½ Common shares valued at $17,767,000, have been accounted for as purchases and included in the consolidated statement of earnings since January 1, 1973.

Upon consolidation all intercompany accounts and transactions have been eliminated.

CX-335-2-28

LIQUID AIR CORPORATION OF NORTH AMERICA
AND SUBSIDIARIES

NOTES TO FINANCIAL STATEMENTS—(Continued)

Currency Translation

The financial statements of the Canadian subsidiaries have been consolidated herein on the basis of translating current assets, current liabilities and long-term debt at the rates of exchange prevailing at each year end, and all other assets, deferred income taxes and shareholder's equity at historical rates of exchange. Earnings, with the exception of depreciation charges and deferred income taxes, have been translated at the average rate of exchange for each year. The net credit (not a material amount) arising from translation has been reflected as an unearned gain and included in current liabilities.

Depreciation and Amortization

The Companies follow the policy of providing for depreciation on the straight-line method by charges to costs or expenses at rates based on estimated useful lives applied to cost, except for assets acquired prior to 1969 (having an undepreciated cost of $6,000,000 at December 31, 1972) which are depreciated on the double declining balance method. If the assets acquired in 1968 had been depreciated that year on the straight-line method, depreciation expense would have been reduced by $350,000. When assets are sold or otherwise disposed of, the cost and related accumulated depreciation are removed from the accounts and any gain or loss is reflected in earnings.

The rates used to compute depreciation provisions are as follows:

Buildings	5%
Cylinders	5%
Machinery and equipment	6⅔ to 10%
Transportation equipment	6⅔ to 25%

Maintenance repairs and minor renewals are charged to expense as incurred; expenditures which substantially increase the useful lives of assets are capitalized.

Intangible Assets

The cost in excess of net assets of consolidated subsidiaries acquired since November 1, 1970 amounted to $6,573,000 at December 31, 1972 (which relates to Gulf Oxygen Industries, Inc. and Dye Oxygen Company) and $6,561,000 at June 30, 1973 (which includes $31,000 relating to a minor 1973 acquisition and reflects six months amortization) and is being amortized over a forty year period.

Such cost arising from acquisitions prior to November 1, 1970, is not being amortized since, in the opinion of the Company, there has been no diminution in value.

Canadian Operations

Net earnings of the Canadian subsidiaries included in consolidated net earnings amounted to $3,691,000, $3,595,000 and $5,045,000 for the years ended 1970, 1971 and 1972, respectively, and $3,327,000 for the period ended June 30, 1973. The consolidated balance sheets include $57,472,000 and $59,553,000 total assets and $35,615,000 and $37,991,000 net assets of the Canadian companies at December 31, 1972 and June 30, 1973, respectively.

Income Taxes

Deferred income taxes have been provided as a result of timing differences in reporting income for financial statements and income tax purposes. The primary difference at December 31, 1972, and at June 30, 1973 relates to depreciation methods.

CX-325-2-29

LIQUID AIR CORPORATION OF NORTH AMERICA
AND SUBSIDIARIES

NOTES TO FINANCIAL STATEMENTS—(Continued)

No provision has been made for Canadian withholding taxes which would be payable upon remittance of the retained earnings at December 31, 1972 of the Canadian subsidiaries, since the Company plans to leave these funds indefinitely reinvested in the business. Consolidated retained earnings includes retained earnings of the Canadian subsidiaries of $7,225,000 at December 31, 1972 and $9,650,000 at June 30, 1973.

Note B—Inventories

Inventories consist of finished goods (purchased and manufactured), raw materials, work in progress, and supplies, which are priced at the lower of cost (calculated principally on a first-in, first-out basis) or market. Inventories used in the determination of cost of products sold in the consolidated statement of earnings are as follows:

January 1, 1970	$14,000,000
December 31, 1970	14,178,000
December 31, 1971	14,407,000
December 31, 1972	17,777,000
January 1, 1973	20,129,000
June 30, 1973	20,978,000

December 31, 1972 ending inventory used in consolidated statement of earnings	$17,777,000
Inventories of subsidiaries acquired as of December 31, 1972	2,352,000
Amount per balance sheet December 31, 1972 and opening inventory January 1, 1973	$20,129,000

	December 31, 1972	June 30, 1973
Inventories consisted of:		
Finished goods	$ 15,874,000	$ 16,076,000
Work in progress	929,000	681,000
Materials and supplies	3,326,000	4,221,000
	$ 20,129,000	$ 20,978,000

Note C—Property, Plant and Equipment

Details of property, plant and equipment, which are stated at cost, are summarized as follows and include assets constructed by an affiliate of approximately $16,000,000:

	December 31, 1972	June 30, 1973
Land	$ 3,166,000	$ 3,290,000
Buildings	11,890,000	13,116,000
Cylinders	34,788,000	35,736,000
Machinery and equipment	72,725,000	75,472,000
Construction in progress	2,634,000	5,204,000
	$125,203,000	$132,815,000

CX-35-2-30

LIQUID AIR CORPORATION OF NORTH AMERICA
AND SUBSIDIARIES

NOTES TO FINANCIAL STATEMENTS—(Continued)

	December 31, 1972	June 30, 1973
Note D—Long Term Debt		
LIQUID AIR CORPORATION OF NORTH AMERICA:		
Note payable to affiliate (American Air Liquide Inc.), 8½% due October 11, 1977	$ 8,000,000	$ 8,000,000
LIQUID AIR INC. AND SUBSIDIARIES:		
1% above prime rate unsecured note payable to bank with interest payable quarterly. Principal payable in quarterly installments of $169,500 through 1978 ($550,000 at June 30, 1973)	9,390,000	11,000,000
Notes payable to banks at 8% and at 1½% above prime rate payable in monthly installments through to 1976	258,177	221,087
Conditional purchase contracts payable in monthly installments through to 1977	965,961	917,328
6%-6¼% unsecured notes payable to insurance companies in quarterly installments through to 1981	1,695,200	1,560,800
6%-8% notes payable to banks in monthly installments through to 1979	253,575	147,422
5¼%-7½% unsecured notes and long-term interest on notes payable to former shareholders	249,989	188,008
6½% note payable to General Services Administration in quarterly installments through to 1979	203,000	—
Conditional purchase contracts and others due in monthly installments through to 1976	134,246	191,095
DYE OXYGEN COMPANY AND SUBSIDIARIES:		
5¼%-6¼% unsecured bank notes payable in annual installments through to 1978	520,000	690,000
5½%-6½% notes due to former stockholders payable in decreasing installments through to 1977	467,288	363,613
6% unsecured insurance company note payable in annual installments through to 1978	300,000	250,000
Various unsecured long-term indebtedness	35,540	30,920
CANADIAN LIQUID AIR LTD. AND SUBSIDIARIES:		
6½% sinking fund debentures series "A" due May 2, 1986, with annual installments of $301,410 to 1985	5,425,380	5,107,140
9¼% sinking fund debentures series "B" due December 1, 1990, with annual installments of $301,410 required 1976 through to 1990	6,028,200	6,008,400
Conditional purchase contracts (assigned to a bank) payable in monthly installments of $18,629	956,490	841,438
8% promissory notes due in 1976 ($198,769) and 1979 ($100,470)	299,239	298,257
5¼% first mortgage sinking fund bonds due January 15, 1982, payable in annual installments increasing from approximately $200,000 to $[illegible],000	3,138,682	2,873,016

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LIQUID AIR CORPORATION OF NORTH AMERICA
AND SUBSIDIARIES

NOTES TO FINANCIAL STATEMENTS—(Continued)

	December 31, 1972	June 30, 1973
U.S. Divers Co. and Subsidiary:		
7% bank note payable in semiannual installments of $25,350 including interest through to 1978	$ —	$ 209,497
Gulf Oxygen Industries, Inc. and Subsidiaries:		
7% mortgage note payable in monthly installments of $3,500 through to 1979	273,000	
Life annuity payable for a former owner in annual installments of $28,000	298,010	270,010
6% mortgage note payable	27,664	
	$38,919,641	$39,168,031
Less current portion	2,870,581	3,916,098
Total Long-Term Debt	$36,049,060	$35,251,933

All long-term debt included above in respect to Canadian Liquid Air Ltd. and subsidiaries is payable in Canadian dollars and has been translated to U. S. dollars at the December 31, 1972 and June 30, 1973 rates of exchange, respectively.

At December 31, 1972 properties carried at depreciated cost of $5,447,000 are subject to mortgage liens. Various miscellaneous debts of approximately $2,566,000 are secured by liens on equipment and properties with an aggregate depreciated cost of approximately $2,550,000 at December 31, 1972. There were no material changes at June 30, 1973.

The principal payments required on long-term debt during the succeeding five years are as follows:

1973	$ 2,900,000
1974	3,800,000
1975	3,800,000
1976	4,200,000
1977	11,600,000

Agreements in connection with the debt of certain subsidiaries require maintenance of stated amounts of working capital and net worth. The companies are not in violation of these agreements and none of the consolidated retained earnings at December 31, 1972 and June 30, 1973 were restricted as to distribution by these agreements (See Note F).

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LIQUID AIR CORPORATION OF NORTH AMERICA AND SUBSIDIARIES

NOTES TO FINANCIAL STATEMENTS—(Continued)

Note E—Charter Amendments

The financial statements reflect retroactively the change in corporate name from International Liquid Air to Liquid Air Corporation of North America and the increase in the number of common shares authorized to 10,000,000 common shares without par value, and the 3.5 for 1 common stock split which took place on March 28, 1973. As a result of the stock split, 1,014,125 common shares are reserved for conversion of the preferred shares.

Note F—Preferred Shares

(i) Dividend rate per share:

To December 31, 1972—nil;
January 1, 1973, to December 31, 1976—5.3375 times the common share rate;
January 1, 1977, and after—$5.50 per annum, cumulative.

(ii) Convertibility:

Each preferred share may be converted into 5.3375 common shares, at the option of the holder, at any time from January 1, 1973, up to the third business day prior to the date fixed for redemption.

(iii) Redemption:

Preferred shares are redeemable from, and after, December 31, 1981, at par value plus accumulated dividends.

(iv) Voting rights:

None except in the event of dividend arrearages for four quarters in which case two directors may be appointed. If at any time, the Consolidated Net Tangible Assets (as defined) of the Company are less than the aggregate par value of the preferred shares then outstanding, such holders shall have the right to elect a majority of the directors.

By agreement the Company shall not, except with the approval of the holders of the preferred shares, declare or pay any dividends on the common shares prior to January 1, 1977, if the aggregate of all such dividends declared since January 1, 1969 exceeds consolidated net earnings (as defined in the agreement) of the Company and subsidiaries since January 1, 1969. As of December 31, 1972, $1,300,000 of consolidated retained earnings was restricted under this agreement. The agreement also imposes limitations on the amount of long-term debt which may be incurred.

Note G—Pensions

The significant subsidiaries have pension plans for eligible employees. Provision for pension plan expense was determined principally on the basis of calculations recommended by the actuaries and amounted to $396,000, $430,000 and $494,000 for the years 1970, 1971 and 1972, respectively, and $310,000 for the six months ended June 30, 1973. The companies' policy is to fund pension costs accrued which are based on the projected benefit cost method with aggregate normal cost whereby past service cost is not separately identified. At December 31, 1972 pension funds exceeded vested benefits.

CX-335-2-33

LIQUID AIR CORPORATION OF NORTH AMERICA
AND SUBSIDIARIES

NOTES TO FINANCIAL STATEMENTS—(Continued)

Note H—Leases

The companies lease certain real property and equipment under leases expiring at various dates until 1989. Payments for 1972 were $1,674,000, and required minimum payments for the subsequent five years are approximately as follows:

1973	$1,640,000
1974	1,520,000
1975	1,445,000
1976	1,285,000
1977	1,230,000

Note I—Commitments and Contingencies

Cost to complete construction in progress is estimated at $4,700,000 at December 31, 1972 and $2,200,000 at June 30, 1973.

Note J—Supplementary Earnings Statement Information

	Charged to Costs and Expenses			
	Years Ended December 31,			Six months ended June 30,
	1970	1971	1972	1973
	(Thousands of Dollars)			
Maintenance and Repairs	$3,308	$3,811	$4,116	$2,296
Taxes—Payroll	1,208	1,290	1,551	1,084
Taxes—Real and Personal Property	1,279	1,378	1,418	829
Rents (applicable to real and personal property)	1,459	1,653	1,683	991
Royalties:				
To L'Air Liquide and Affiliates	1,300	1,613	1,957	1,181
To others	234	435	558	112
Interest on Long-Term Debt	2,383	2,386	2,419	1,178

The above amounts include 1970 charges relating to discontinued operations as follows:

Maintenance and Repairs	6
Taxes—Payroll	11

Amounts for advertising costs and research and development were less than 1% of sales.

A 4959

CX-335-2-34

REPORT OF INDEPENDENT ACCOUNTANTS

To the Board of Directors and Stockholder of
Dye Oxygen Company:

We have examined the consolidated balance sheet (not shown separately herein) of Dye Oxygen Company and its subsidiaries as of December 31, 1972, and the related consolidated statements of income and of changes in stockholder's equity for the year ended August 31, 1969, the four months ended December 31, 1969 and the three years ended December 31, 1972 and the related consolidated statements of changes in financial position for the three years ended December 31, 1972. Our examinations were made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

Comparability of the accompanying financial statements has been affected by a change, with which we concur, in the estimated useful lives of cylinders effective January 1, 1970, as described in Note 2.

In our opinion, the consolidated financial statements examined by us present fairly the financial position of Dye Oxygen Company and its subsidiaries at December 31, 1972, the results of their operations for the year ended August 31, 1969, the four months ended December 31, 1969 and the three years ended December 31, 1972 and the changes in financial position for the three years ended December 31, 1972, in conformity with generally accepted accounting principles consistently applied during the period and on a basis consistent with that of the preceding year except for the change, with which we concur, in estimated useful lives as described in Note 2.

PRICE WATERHOUSE & CO.

Phoenix, Arizona
February 20, 1973

Dorothy Ann Kelly

A 4960

CX-335-2-35

DYE OXYGEN COMPANY AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF INCOME

	Years Ended		Four Months	Years Ended		
	August 31, 1968 (Unaudited)	August 31, 1969	December 31, 1969	December 31, 1970	December 31, 1971	December 31, 1972
	(Thousands of Dollars)					
Net sales	$3,985	$4,545	$1,653	$5,908	$7,147	$8,347
Other income	73	77	22	115	108	94
	4,058	4,622	1,675	6,023	7,255	8,441
Costs and expenses:						
Cost of products sold (Note 3)	1,942	2,084	765	2,812	3,613	4,248
Selling, distribution, general and administrative expenses	1,303	1,405	464	1,711	2,031	2,268
Depreciation and amortization (principally applicable to products sold) (Notes 1 and 2)	499	415	121	377	506	623
Interest	48	46	18	43	53	66
	3,792	3,950	1,368	4,943	6,203	7,205
Income before income taxes, minority interest and extraordinary items	266	672	307	1,080	1,052	1,236
Income taxes: (Notes 1 and 5)						
Current	112	342	162	500	450	497
Deferred	—	—	—	35	60	52
	112	342	162	535	510	549
Income before minority interest and extraordinary items	154	330	145	545	542	687
Minority interest (Note 1)	(9)	(7)	(5)	35	19	—
Income before extraordinary items	163	337	150	510	523	687
Extraordinary items, net of income tax (Note 6)	—	36	—	—	—	—
Net income	$ 163	$ 373	$ 150	$ 510	$ 523	$ 687

The accompanying notes are an integral part of these financial statements.

A 4961

CX-385-2-36

DYE OXYGEN COMPANY AND SUBSIDIARIES

CONSOLIDATED STATEMENT OF CHANGES IN STOCKHOLDERS' EQUITY

For Four Years and Four Months Ended December 31, 1972

	Common Stock				Treasury Stock		
	Shares	Amount	Paid in Capital	Retained Earnings	Shares	Amount	Total
			(Thousands of Dollars)				
Balance at August 31, 1968	927	$92	$384	$1,972	19	$(68)	$2,380
Net income for the year				373			373
Exchange of shares in payment of note	11	1	54				55
Balance at August 31, 1969	938	93	438	2,345	19	(68)	2,808
Net income for the period				150			150
Balance at December 31, 1969	938	93	438	2,495	19	(68)	2,958
Net income for the year				510			510
Exchange of shares in payment of note	22	3	108				111
Treasury stock purchased					2	(12)	(12)
Balance at December 31, 1970	960	96	546	3,005	21	(80)	3,567
Net income for the year				523			523
Exchange of shares in payment of note	11	1	54				55
Balance at December 31, 1971	971	97	600	3,528	21	(80)	4,145
Net income for the year				687			687
Stock issued as compensation	2	—	10				10
Treasury stock purchased					10	(69)	(69)
Balance at December 31, 1972 (Note 8)	973	$97	$610	$4,215	31	$(149)	$4,773

( ) Indicates deductions.

The accompanying notes are an integral part of these financial statements.

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CX-335-2-37

DYE OXYGEN COMPANY AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CHANGES IN FINANCIAL POSITION

	Years Ended December 31,		
	1970	1971	1972
	(Stated in thousands of dollars)		
Financial Resources Were Provided By:			
Net income	$ 510	$ 523	$ 687
Add (deduct) income charges (credits) not affecting working capital			
Depreciation and amortization	377	506	636
Deferred income taxes	35	60	52
Common stock issued as compensation			9
Minority interest in net income of consolidated subsidiary	35	19	
Gain on sale of property, plant and equipment, net of income taxes	(74)	(67)	(59)
Working capital provided by operations	883	1,041	1,325
Cash received on sale of property, plant and equipment, net of income taxes	127	143	173
Increase in long-term debt including $38,669 and $454,545, in 1970 and 1971, respectively, assumed in acquisitions	109	957	401
Note receivable from officer			105
Other			10
Issuance of common stock for retirement of debt	111	55	
Consolidation of Dye Nevada—			
Minority interest prior to consolidation	254		
Elimination of Company's investment	133		
	$1,617	$2,196	$2,014
Financial Resources Were Used For:			
Purchase of property, plant and equipment including $232,230 and $738,153 in 1970 and 1971, respectively, relating to acquisitions	$ 709	$1,275	$1,146
Increase in non-current receivables	80	25	
Reduction of long-term debt	149	474	225
Purchase of treasury stock	12		68
Purchase of additional interests in Dye Nevada	91	227	
Other	5	53	
Increase in working capital, including the working capital (deficit) of acquired companies of $216,573 in 1970 and ($344,544) in 1971	571	142	575
	$1,617	$2,196	$2,014
The Components Comprising the Increase (Decrease) in Working Capital are as Follows:			
Cash and short-term investments	$ 172	($ 65)	$ 235
Receivables	(40)	239	121
Merchandise inventories	173	289	42
Prepaid expenses	1	12	42
Current portion of long-term debt	46	(152)	70
Accounts payable	(37)	(83)	64
Accrued expenses and payroll taxes	(41)	(48)	15
Contribution to retirement income plan	12	(8)	(1)
Federal and state income taxes	285	(42)	(13)
	$ 571	$ 142	$ 575

The accompanying notes are an integral part of these financial statements.

CX-335-Z-38

DYE OXYGEN COMPANY AND SUBSIDIARIES

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

1. Summary of Accounting Policies:

Principles of consolidation—

The consolidated financial statements include the accounts of the Company and its subsidiaries after elimination of all material intercompany transactions.

The Company acquired a 34.8% interest in Dye Oxygen of Nevada, Inc. (Dye Nevada) when Dye Nevada was formed in 1963. The Company included in income its proportionate share of Dye Nevada's income in each period until 1970 when the Company acquired an additional 21.9% interest and began consolidating the accounts of . . 's subsidiary. In 1971 the Company acquired the remaining 43.3% interest in Dye Nevada thereby increasing net income by $2,900.

In April, 1971 the Company purchased the assets and assumed the liabilities of Texas Oxygen Company which acquisition contributed sales of $653,000 and a net loss of $15,000 to the consolidated operations of the Company from the date of acquisition to December 31, 1971. Pro forma operating results of the Company and Texas Oxygen for the twelve months ended December 31, 1971 would not materially change the consolidated operating results of the Company reported herein.

Depreciation—

Depreciation is computed using principally accelerated methods based upon estimated economic lives (Note 2) ranging from 5 to 25 years.

Repairs and maintenance are charged to income as incurred. Betterments and renewals are capitalized. The cost of property sold or otherwise disposed of and related accumulated depreciation is removed from the accounts and any profit or loss resulting from the disposal is reflected in earnings.

Inventories—

Inventories are valued at the lower of cost (first-in, first-out) or market.

Retirement income plan—

The Company maintains a non-contributory retirement income plan for eligible employees. The Company accrues as expense current costs and amortization of the initial past service liability over a period of ten years from the inception of the plan in 1965. It is the Company's policy to fund plan costs as accrued.

Income taxes—

Deferred income taxes result from the Company's policy of using different lives for cylinders and certain other assets for tax purposes than those used for financial reporting purposes.

Investment tax credit is used to reduce the income tax provision under the flow-through method.

2. Change in Accounting Estimate:

In 1970, the estimated useful lives of cylinders were extended from eleven to twenty years. The result of this change increased net income in 1970 by $33,000.

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DYE OXYGEN COMPANY AND SUBSIDIARIES

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

3. Inventories:

Inventories used in the computation of costs of goods sold were $653,096, $825,901, $1,115,125, and $1,156,774 at December 31, 1969, 1970, 1971 and 1972 respectively.

4. Retirement Income Plan:

Under the Company's retirement income plan, employees become eligible on August 31 following five years of full time employment. The plan is a deposit administration fund under a group annuity contract with a life insurance company.

The Company's cost of the plan was $60,660 in 1970, $69,240 in 1971 and $69,855 in 1972.

5. Income Taxes:

The provision for income taxes is composed of the following:

	Years Ended August 31,		Four Months Ended December 31,	Years Ended December 31,		
	Not covered by accountants' report 1968	1969	1969	1970	1971	1972
			(000 omitted)			
Federal—						
Payable before giving effect to investment credit realized	$116	$355	$150	$458	$416	$515
Investment credit realized	(15)	(7)			(10)	(69)
Deferred—net				35	60	52
State	11	30	12	42	44	51
	112	378	162	535	510	549
Provision applied to extraordinary items		(36)				
Provision for income taxes	$112	$342	$162	$535	$510	$549

Included in "deferred—net" above for 1972 is $4,000 applicable to state income taxes.

6. Extraordinary Items:

In fiscal 1969 the Company sold equipment for an extraordinary gain of $98,000. In addition, the Company determined in 1968 that certain assets having a depreciated cost of $56,000 were missing. The $36,000 extraordinary gain is composed of the following:

Gain on sale of equipment	$98,000
Depreciated cost of assets missing	(56,000)
Other	30,000
	72,000
Less applicable income taxes	(36,000)
	$36,000

CX-335-2-40

DYE OXYGEN COMPANY AND SUBSIDIARIES

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

7. Commitments:

The Company has entered into certain lease agreements expiring at various dates through 1988. Most leases are renewable at the option of the Company. Remaining lease rentals total $254,000 as of December 31, 1972 and the minimum annual rentals are $60,000 in 1973, $46,000 in 1974, $46,000 in 1975, $46,000 in 1976 and $33,000 in 1977.

8. Restriction on Retained Earnings:

The Company has certain borrowings which restrict the payment of dividends in excess of 60% of net earnings since August 31, 1961 and accordingly $1,817,000 of retained earnings are restricted at December 31, 1972.

9. Change in Ownership:

Effective December 28, 1972, all of the outstanding shares of the Company's stock were exchanged for shares of Liquid Air Corporation of North America (formerly International Liquid Air Inc.).

10. Supplementary Information to the Statements of Income:

The amounts below are included in costs and expenses on the statements of income.

	Years Ended December 31,		
	1970	1971	1972
Maintenance and repairs	$180,000	$227,000	$208,000
Taxes, other than income taxes (including payroll taxes of $64,000 in 1970).....	112,000	85,000	130,000

Expenses of amortization of intangible assets, rents, research and development and advertising did not exceed one percent of revenues in each of the respective periods.

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cx-335-2-41

REPORT OF INDEPENDENT ACCOUNTANTS

The Board of Directors
Gulf Oxygen Industries, Inc.

I have examined the consolidated balance sheet of Gulf Oxygen Industries, Inc. and subsidiaries as of December 31, 1972, and the combined statements of income and shareholders' equity of the Companies that are now subsidiaries of Gulf Oxygen Industries, Inc., for the five years then ended and the related statements of changes in financial position for the three years then ended. My examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as I considered necessary in the circumstances.

In my opinion, the consolidated balance sheet (not presented separately herein) presents fairly the consolidated financial position of Gulf Oxygen Industries, Inc. and subsidiaries at December 31, 1972, and the combined statements of income and shareholders' equity present fairly the combined results of operations and changes in shareholders' equity of the Companies that are now subsidiaries of Gulf Oxygen Industries, Inc. for the five years ended December 31, 1972 and changes in their combined financial position for the three years then ended, all in conformity with generally accepted accounting principles consistently applied.

MICHAEL J. DE BLANC
Certified Public Accountant

New Iberia, La.
February 12, 1973

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CX-335-2-42

GULF OXYGEN INDUSTRIES, INC. GROUP

COMBINED STATEMENTS OF EARNINGS

	Years Ended December 31,				
	1968	1969	1970	1971	1972
	(Thousands of Dollars)				
Net sales	$5,994	$6,290	$8,287	$8,203	$9,080
Other income	17	61	32	108	146
	6,011	6,351	8,319	8,311	9,226
Costs and expenses:					
Cost of products sold	3,767	3,602	4,637	4,653	5,062
Selling, distribution, general and administrative expenses	1,236	1,486	2,306	2,234	2,398
Depreciation and amortization (principally applicable to cost of products sold)	422	700	685	607	836
Interest	107	121	118	147	159
	5,532	5,909	7,746	7,641	8,455
Income before income taxes and extraordinary items	479	442	573	670	771
Income taxes—current provision	109	167	257	286	254
Income before extraordinary items	370	275	316	384	517
Extraordinary items, net of income tax(2)	—	15	93	—	—
Net earnings	$ 370	$ 260	$ 223	$ 384	$ 517

(1) Investment credits amounted to $28,000, $7,000, $4,000, $32,000, and $120,000 for the years 1968, 1969, 1970, 1971, and 1972, respectively.

(2) Represents write off of investment in a subsidiary company (1969) and write off of good will on a company acquired (1970).

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GULF OXYGEN INDUSTRIES, INC. GROUP

COMBINED STATEMENT OF SHAREHOLDERS' EQUITY

For Five Years Ended December 31, 1972

	Preferred Stock	Common Stock	Paid in Capital	Treasury Stock	Retained Earnings	Total
			(Thousands of Dollars)			
Balance at December 31, 1967	$ 267	$ 396	$ 111	$ (13)	$1,544	$2,305
Net earnings					370	370
Balance at December 31, 1968	267	396	111	(13)	1,914	2,675
Net earnings					260	260
Shares issued		20				20
Treasury stock purchased				(13)		(13)
Balance at December 31, 1969	267	416	111	(26)	2,174	2,942
Net earnings					223	223
Shares issued		60				60
Treasury shares purchased				(17)		(17)
Balance at December 31, 1970	267	476	111	(43)	2,397	3,208
Net earnings					384	384
Treasury shares purchased				(4)		(4)
Balance at December 31, 1971	267	476	111	(47)	2,781	3,588
Net earnings					517	517
Treasury shares purchased				(335)		(335)
Treasury shares re-issued			1	(1)		
Balance at December 31, 1972 Before Reorganization	267	476	112	(383)	3,298	3,770
Reorganization and merger of all companies into Gulf Oxygen Industries, Inc.	(267)	(475)	3,657	383	(3,298)	
Balance at December 31, 1972	$ —	$ 1	$3,769	$ —	$ —	$3,770

( ) Indicates deductions.

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GULF OXYGEN INDUSTRIES, INC. GROUP

COMBINED STATEMENTS OF CHANGES IN FINANCIAL POSITION

	Years Ended December 31,		
	1970	1971	1972
SOURCE OF FUNDS:	(Thousands of Dollars)		
Current operations:			
Net earnings	$ 223	$ 384	$ 517
Expenses not requiring current cash outlays:			
Depreciation	685	607	836
Total from operations	908	991	1,353
Sale of fixed assets	102	181	129
Sale of life insurance policy			57
Additional long-term debt	217	420	270
Common shares issued for cash	60		
Cash value of life insurance acquired	51		
Total Source	$1,338	$1,592	$1,809
DISPOSITION OF FUNDS:			
Decrease in long-term debt	$ 15	$ 625	$1,287
Additions to fixed assets	421	1,916	931
Payment of other liabilities			46
Purchase of treasury stock	17	4	335
Increase in investments	84		
Fixed assets of subsidiary	273		
Other	150		30
Total disposition	$ 960	$2,545	$2,629
Increase (decrease) in working capital	$ 378	($ 953)	($ 820)
CHANGES IN COMPONENTS OF WORKING CAPITAL:			
Increase (decrease) in current assets:			
Cash and marketable securities	$ 730	($ 483)	($ 585)
Receivables	30	(3)	3
Inventories	154	52	38
Prepaid expenses	53	10	29
	967	(424)	(515)
Increase (decrease) in current liabilities:			
Accounts payable and accrued	(71)	(113)	(285)
Income taxes	(48)	29	(760)
Current maturities of long-term debt			(174)
Notes payable	(470)	(69)	1,214
Contract payable		(376)	(300)
	(589)	(529)	(305)
Increase (decrease) in working capital	$ 378	($ 953)	($ 820)

CX-335-2-45

GULF OXYGEN INDUSTRIES, INC. GROUP

NOTES TO COMBINED FINANCIAL STATEMENTS

Note (A) Principles of Combination

The combined financial statements include the accounts of the Companies that are subsidiaries of Gulf Oxygen Industries, Inc. at December 31, 1972, for the five years then ended or since the date of coming under common control. All significant inter-company transactions have been eliminated.

Note (B) Depreciation Policy

The companies depreciate their fixed assets on the double declining method using the following rates:

Buildings	5 %
Cylinders	8½%
Transportation equipment	25 %
Machinery and equipment	10 %

Note (C) Inventories

The companies inventories, which are primarily finished goods, that have been used in determining cost of goods sold for the last three years are:

1969	$1,127,000
1970	1,110,000
1971	1,157,000
1972	1,195,000

Note (D) Pensions

The companies have no pension plans.

Note (E) Profit Sharing Plans

Amounts charged to operations by the companies in respect of profit sharing plans are:

1970	$12,400
1971	14,600
1972	12,500

Note (F) Income Taxes

Amounts charged to operations by the companies in respect of income taxes may be summarized as follows:

	Federal	State
1970	$240,000	$17,000
1971	261,000	25,000
1972	227,000	27,000

Note (G) Supplementary Earnings Statement Information

	Charged to Costs and Expenses
Maintenance and Repairs:	
Year ended December 31, 1970	$162,000
Year ended December 31, 1971	74,000
Year ended December 31, 1972	167,000

Taxes, rents, royalties, advertising and research and development expenses are each less than one percent of sales.

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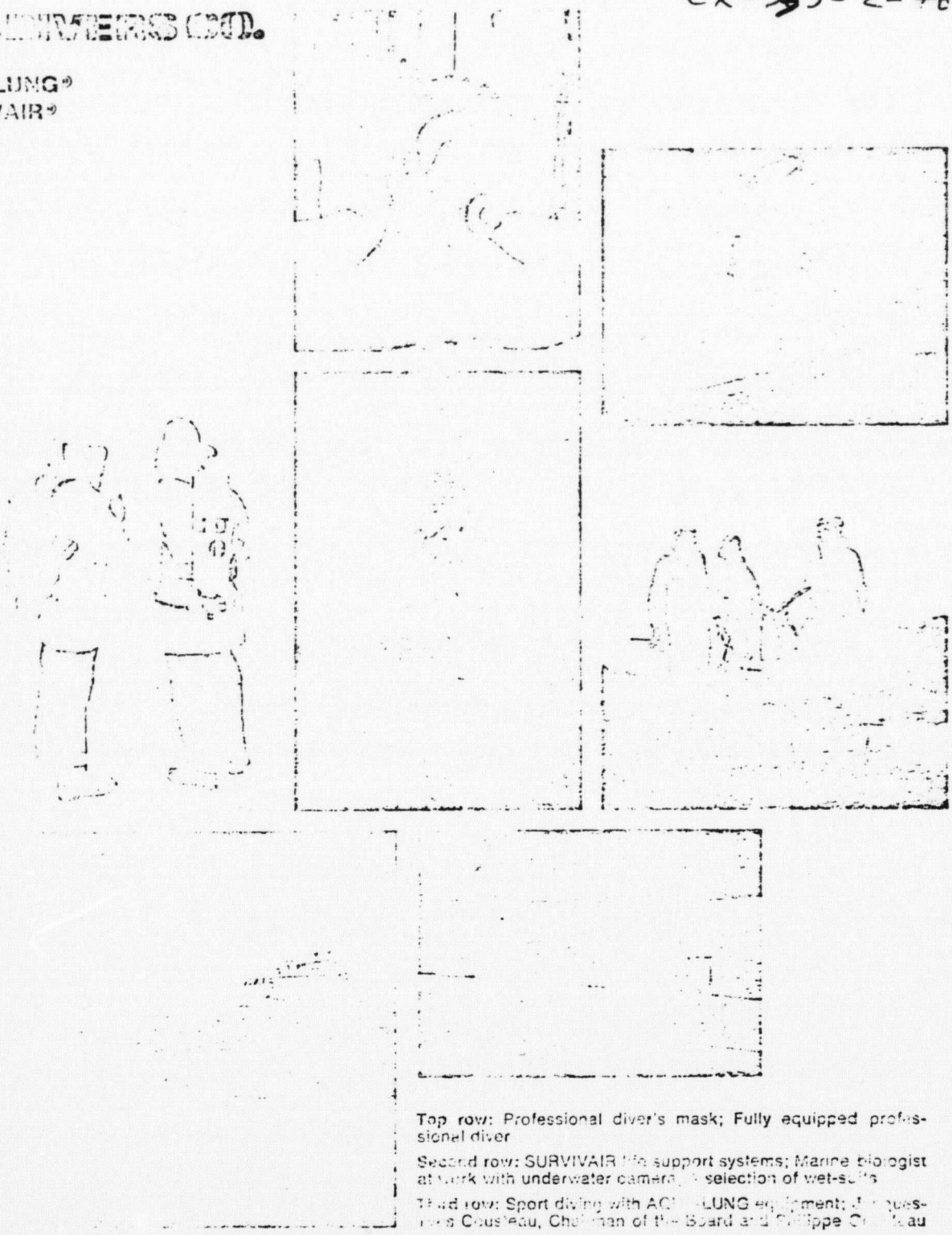
...DIVERS (1971) LTD.

...LUNG®
...VAIR®



Top row: Professional diver's mask; Fully equipped professional diver

Second row: SURVIVAIR life support systems; Marine biologist at work with underwater camera; A selection of wet-suits

Third row: Sport diving with ACLA-LUNG equipment; Jacques-Yves Cousteau, Chairman of the Board and Philippe Cousteau

A 4972

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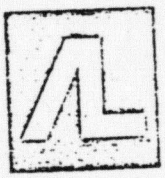
736,333 Shares

Liquid Air Corporation of North America

Common Stock



Goldman, Sachs & Co.
Lazard Frères & Co.
Representatives of the Underwriters

A 4973

CX-335-2-48

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 22. Marketing Arrangements.

Reference is made to Section 1(b)(iv) of the Underwriting Agreement, to Sections 4, 5 and 9 of the Agreement Among Underwriters and to the fifth and seventh paragraphs of the Selling Agreement, filed as Exhibit 1 to the Registration Statement.

Item 23. Other Expenses of Issuance and Distribution.

Estimated expenses payable by the registrant in connection with the sale of the stock being offered hereby, are:

	Registrant*
Registration Fee	$ 3,976
NASD Filing Fee	2,020
Stock Exchange Listing Fees	
Blue Sky and Canadian Filing Fees and Expenses (including counsel)	
Printing and Engraving Expenses	
Transfer Agent's and Registrar's Fees	
Legal Fees and Expenses	
Accounting Fees and Expenses	
Miscellaneous	
Total	$

* Does not include expenses of approximately $ to be paid by the Selling Stockholders.

Item 25. Recent Sales of Unregistered Securities.

The following table sets forth information relating to sales of Common Stock by the registrant within the past three years (all figures below reflect a 3.5 for one stock split effective March 28, 1973). The shares set forth below represent all the issued and outstanding shares of registrant:

Date	Purchaser	Number of Shares	Consideration
10/12/72	L'Air Liquide	4,199,811	946 Canadian Liquid Air Ltd. common shares
10/12/72	American Air Liquide Inc.	260,610	58,950 Liquid Air Inc. common shares
10/12/72	Pierre A. Salbaing	13,387½	1,744 Liquid Air Inc. common shares
10/12/72	Mike V. Breber	8,046½	1,048 Liquid Air Inc. common shares
10/12/72	M. V. Breber & Associates, Inc.	5,341	696 Liquid Air Inc. common shares
10/12/72	William E. Dempster	13,387½	1,744 Liquid Air Inc. common shares
10/12/72	La Spirotechnique	357,721½	22,145 U.S. Divers Co. common shares
10/12/72	American Air Liquide Inc.	23,054½	1,427 U.S. Divers Co. common shares
10/12/72	Captain Jacques Yves Cousteau	23,065	1,428 U.S. Divers Co. common shares
12/22/72	L'Air Liquide	53,844	$999,960 cash
12/28/72	American Air Liquide Inc.	90,471½	165 Dye Oxygen Company common shares
12/29/72	Stockholders(1) of Dye Oxygen Company	426,058½	777 Dye Oxygen Company common shares
12/31/72	Stockholder (2) of Gulf Oxygen Industries, Inc.	430,142½	100,000 Gulf Oxygen Industries, Inc. common shares

(1) The Stockholders of Dye Oxygen Company, excluding American Air Liquide Inc. were as follows:

Gilbert V. Dye and Doris M. Dye

Gilbert V. Dye, Jr. and Joanne V. Dye jointly and/or as Trustee and Custodian for various family members

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Dorthy Ann Reilly

William P. Reilly, Jr. and Dorthy Ann Reilly jointly, and as Trustees and/or Custodian for various family members

Dwight Portugal and Jeanne Portugal

June L. Alexander

(2) The stockholders of Gulf Oxygen Industries, Inc. were as follows:

Earl H. Hines
John D. Hines
W. Ray Hines
Earl H. Hines, Jr.
William G. Hines
Harley N. Hebert
Margie K. Hebert
Eugene C. Guidry
Don W. Johnston
Daniel J. Bergeron
John Le Blanc

On October 12, 1972 Exxon Enterprises, Inc. purchased from registrant 190,000 shares of Convertible Preferred Stock for $19,000,000. On conversion, each share of the Preferred Stock is entitled to 5.3375 shares of Common Stock.

On October 12, 1972, the Company issued a promissory note in the principal amount of $8,000,000 to American Air Liquide Inc. in exchange for $8,000,000 in cash.

On , 1973 L'Air Liquide, American Air Liquide Inc. and La Spirotechnique purchased 93,341, 8,388, and 8,271 shares of Common Stock of registrant, respectively, at a price of $ per share. [to be completed by amendment]

No underwriters were involved in any of the above transactions.

In the case of all sales of Common Stock, the purchasers were a limited number of either stockholders of corporations acquired by the registrant or present stockholders of the registrant. In the case of the sale of Preferred Stock, the purchaser had been the holder of 190,000 Preferred Shares of Canadian Liquid Air Ltd. (see "Subsidiaries"), which shares were purchased for cancellation by Canadian Liquid Air Ltd. immediately prior to the purchase by Exxon Enterprises Inc. of the registrant's Preferred Shares. All purchasers in all of the above transactions signed letters of non-distributive intent, and all share certificates issued by registrant were appropriately legended. In reliance upon these facts, exemption from registration is claimed under section 4(2) of the Securities Act of 1933.

Item 31. Financial Statements and Exhibits.

(a) Financial Statements and Schedules filed as part of this Registration Statement:

Included in the Prospectus:

Liquid Air Corporation of North America:

Consolidated Balance Sheets, December 31, 1972 and June 30, 1973 (Unaudited).

Consolidated Statements of Earnings for the five years ended December 31, 1972 and the six months ended June 30, 1973 (Unaudited).

Consolidated Statements of Shareholders' Equity for the five years ended December 31, 1972 and the six months ended June 30, 1973 (Unaudited).

Consolidated Statements of Changes in Financial Position for the three years ended December 31, 1972 and the six months ended June 30, 1973 (Unaudited).

Parent Company Balance Sheets, December 31,1972 and June 30, 1973 (Unaudited).

Parent Company Statements of Earnings for the year ended December 31, 1972 and the six months ended June 30, 1973 (Unaudited).

Parent Company Statements of Changes in Financial Position for the year ended December 31, 1972 and the six months ended June 30, 1973 (Unaudited).

Notes to Financial Statements.

ex-35-2-50

Dye Oxygen Company:

Report of Independent Accountants.

Consolidated Statements of Income for the years ended August 31, 1968 (unaudited) and 1969, the four months ended December 31, 1969, and the three years ended December 31, 1970, 1971 and 1972.

Consolidated Statement of Stockholders' Equity for the four years and four months ended December 31, 1972.

Consolidated Statements of Changes in Financial Position for the three years ended December 31, 1972.

Notes to the Consolidated Financial Statements.

Gulf Oxygen Industries, Inc.:

Report of Independent Accountants.

Combined Statements of Earnings for the five years ended December 31, 1972.

Combined Statement of Shareholders' Equity for the five years ended December 31, 1972.

Combined Statements of Changes in Financial Position for the three years ended December 31, 1972.

Notes to Combined Financial Statements.

Included in the Registration Statement but not in the Prospectus:

Consents of Independent Accountants:

Ernst & Ernst

Campbell, Sharp, Nash & Field

Arthur Young & Company

Main Lafrentz & Co.

Price Waterhouse & Co.

Michael J. DeBlanc

Liquid Air Corporation of North America:

Schedules III, V, VI, VII, XII, and XIII.

Exhibit—Computation of Earnings Per Share.

Dye Oxygen Company:

Schedules V, VI and XII.

Gulf Oxygen Industries, Inc.:

Schedules V, VI and XII.

Schedules Omitted:

All other schedules for which provision is made in the applicable accounting regulation of the Securities and Exchange Commission are not required under the related instructions or are inapplicable and therefore have been omitted.

There is no information to report with regard to the matters covered by "Part E—Historical Financial Information."

(b) Exhibits:

1 — Form of Agreement Among Underwriters with forms of Underwriting Agreement and Selling Agreement [revised forms to be filed by amendment].

13(M) —Guaranty Agreement dated August 13, 1973, pursuant to which Liquid Air Inc. has guaranteed certain borrowings by the Registrant.

CX-335-2 S1

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Registrant has duly caused this amendment to the Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of New York, and State of New York, on the 28th day of October, 1973.

LIQUID AIR CORPORATION OF NORTH AMERICA

By PIERRE A. SALBAING
(Pierre A. Salbaing, President)

Pursuant to the requirements of the Securities Act of 1933, this amendment to the Registration Statement has been signed below by the following persons in the capacities and on the date indicated:

Signature	Title	Date
*JEAN H. DELORME (Jean H. Delorme)	Chairman of the Board	October 28, 1973
PIERRE A. SALBAING (Pierre A. Salbaing)	President and Director (Principal Executive Officer)	
*MIKE V. BREBER (Mike V. Dreber)	Vice President and Director (Principal Financial Officer)	
*WARD J. SHERIDAN (Ward J. Sheridan)	Secretary-Treasurer (Principal Accounting Officer)	
..... (William E. Dempster)	Director	
*JEAN P. PINEAU (Jean P. Pineau)	Director	
*EMILIO A. DOMINIANNI (Emilio A. Dominianni)	Director	
*DONALD R. GANT (Donald R. Gant)	Director	
*JACQUES G. MAISONROUGE (Jacques G. Maisonrouge)	Director	
*H. EUGENE MCBRAYER (H. Eugene McBrayer)	Director	
*COLIN W. WEBSTER (Colin W. Webster)	Director	

*By PIERRE A. SALBAING
(Pierre A. Salbaing, Attorney-in-Fact)

A 4977

GUARANTEE AGREEMENT

TO: The Royal Bank of Canada
New York Agency ("Bank")
63 William Street
New York, New York

WHEREAS -

A. LIQUID AIR CORPORATION OF NORTH AMERICA, a Delaware Corporation ("Borrower"), has obtained from Bank a Line of Credit dated October 13, 1972 in the amount of SIX MILLION TWO HUNDRED AND TWENTY THOUSAND UNITED STATES DOLLARS ($6,220,000) with interest at a rate of Bank's New York prime rate for corporate borrowers (other than small businesses) plus one percent (1%) per annum, to be evidenced by Promissory Notes (the "Notes").

B. As a condition for obtaining said Line of Credit, Bank has requir that LIQUID AIR INC., a Delaware Corporation ("Guarantor") execute this agreement guaranteeing payment of the loans as hereinafter provided.

NOW, THEREFORE, for valuable consideratio , receipt of which is hereby acknowledged, Guarantor hereby agrees as follows:

1. Guarantor guarantees the full and timely payment to Bank of all indebtedness, including interest accrued thereon, of Borrower to Bank incurred pursuant to the Line of Credit, and the prompt performance of all obligations of Borrower under the Line of Credit and the Notes in accordance with the terms thereof. The liability of Guarantor to Bank hereunder in no event shall exceed the principal amount advanced to Borrower pursuant to the Line of Credit plus accrued interest.

2. No failure on the part of Bank to proceed against Borrower for th payment of the Notes or an part thereof or to request Guarantor to perform its obligations under this guarantee agreement shall be deemed a waiver by Bank of its right to later elect to have guarantor perform its obligations under this guarantee agreement, provided, however, that at such later time

Borrower is in default under the terms of the Line of Credit or the Notes.

3. Bank may grant time, renewals, extensions, indulgences, releases and discharges to, take securities (which word as used herein only includes other guarantees) from, cease or refrain from giving credit or making loans or advances to, accept compositions from and otherwise deal with, Borrower and with all securities as Bank may reasonably see fit, and may apply all moneys at any time received from Borrower upon such part of the indebtedness as Bank deems best and change any such application in whole or in part from time to time as Bank may see fit, the whole without in any way limiting or lessening the liability of Guarantor under this guarantee.

4. Bank shall not be bound to exhaust its recourse against Borrower before being entitled to payment from Guarantor the indebtedness. Guarantor hereby waives notice of acceptance of this guarantee and all other notices and demands in connection herewith, including but not limited to presentment, protest, notice or demand upon the Borrower. All payments hereunder shall be made to Bank at a branch or Agency of Bank.

5. Guarantor shall be bound by the account settled between Bank and Borrower.

6. This agreement shall inure to the benefit of Bank, its successors and assigns and any person or persons including any banking institution or institutions to whom it may grant any interest in the note or this guarantee agreement. No such grant or assignment shall in any manner affect Guarantor's liabilities hereunder on any part of the obligations retained by Bank.

A4979 CX-385-2-54

7. This guarantee agreement constitutes the entire agreement between Bank and Guarantor. No officer, employee or other representative of either Bank or Guarantor has any authority to waive, change or modify any provisions hereof except by a writing executed by duly authorized officers of both parties and appended hereto.

8. Any notices required or permitted to be given hereunder shall be in writing and addressed as follows:

To Guarantor:

Liquid Air Inc.
One Embarcadero Center
San Francisco, California 94111
Attn: W.J. Sheridan

To Bank:

The Royal Bank of Canada
New York Agency
68 William Street
New York, New York 10005
Attn: _____

9. In the event that either party shall bring legal action against the other to enforce its rights hereunder, the prevailing party in that legal action shall be entitled to recover the cost and expenses of maintaining or defending said action, including reasonable attorneys' fees.

10. This guarantee agreement shall be governed by and construed according to the laws of the State of New York.

Given Under Seal at San Francisco, California, this 13th day of August, 1973

LIQUID AIR INC.

BY _____
Vice President

A 4980

CX 342-A

STANFORD RESEARCH INSTITUTE
MENLO PARK, CALIFORNIA 94025
(415) 326-6200

Executive Offices

June 25, 1974

Judge Ernest G. Barnes
Administrative Law Judge
Federal Trade Commission
Room 7314
1101 Pennsylvania Avenue N.W.
Washington, D.C. 20580

Re: The Matter of British Oxygen Company, Ltd. et
Docket No. 8955

Dear Judge Barnes:

In response to the Subpoena Duces Tecum served on Stanford Research Institute on June 24 in connection with the above-referenced matter, I am enclosing a proprietary report, entitled The U.S. Industrial Gas Industry, prepared by Stanford Research Institute
together with a copy of the proposal which led to the research project. This is the only study conducted by Stanford Research Institute since 1972 relating to the U.S. market. Our files contain no background materials or correspondence relating to the project.

I would like to emphasize that this report is a proprietary report and contains substantial confidential information belonging to
We ask that the report and proposal be placed in camera if, in fact, it becomes part of the court records. If it is ultimately determined that the report has no particular relevancy to the proceedings, we would like it returned as soon as possible. Thank you for your cooperation in this matter.

Very truly yours,

Geoffrey Steel
General Counsel

GS:cc
Enclosures

A 4981
CLIENT PRIVATE
CX 342-8

November 1972

THE U.S. INDUSTRIAL GAS INDUSTRY

By: J. T. MacKENZIE and S. L. SODER

SRI Project ECC-1949

CLIENT PRIVATE

A 4982

CX 342-C

The work was conducted within the Chemical Industry Economics group of the Economics Division, and R. L. Glauz, Senior Industrial Economist, and J. T. MacKenzie, Industrial Economist, had primary responsibility for the study. The project leader was J. T. MacKenzie. S. L. Soder, Literature Chemist, was the author of the carbon dioxide and helium sections and contributed additional information. Other SRI staff members contributing to the report were F. E. Weil, Senior Industrial Economist; Dr. W. J. Schumacher, Chemical Engineer; and B. M. Louks, Senior Industrial Economist.

SERI
A 4983
CX342-D

Proposal No. ECC-72-97

May 3, 1972

CLIENT PRIVATE

Biographies of the two staff members who will be directly responsible for the study are attached to this proposal. A preliminary report in the form of an oral presentation could be presented by June 1, 1972, or the following week, to be followed by a final report in ten copies. A formal research agreement is not required: however, certain provisions of the Institute's official research agreement are incorporated as a part of this proposal.

This proposal will remain in effect until May 30, 1972; however, the Institute will be pleased to consider an extension if requested.

Very truly yours,

J. T. MacKenzie
Industrial Economist

Approved:

Kenneth E. Lunde, Director
Chemical Industry Economics

Attachments: Excerpts from Standard Research Agreement
Biographies – R. Glauz, Jr., J. MacKenzie

A 4985

CX 342-F

STANFORD RESEARCH INSTITUTE
MENLO PARK, CALIFORNIA 94025
(415) 326-6200

Executive Offices

2051

July 3, 1974

Mr. K Thurmond
Federal Trade Commission
932 Pennsylvania Building
425 13th Street N.W.
Washington, D.C. 20004

Re: The Matter of British Oxygen Company, Ltd. et al
Docket No. 8955

Dear Mr. Thurmond:

In response to the questions you raised in our phone conversation today in connection with the above-referenced matter, Dr. Andrew G. Kridl was first employed by Stanford Research Institute on October 1, 1972. His initial position was Senior Industrial Economist. On or about December 1, 1972, he was appointed Director of Chemical Industries Department. On or about April 1, 1974, he was appointed Director and Chairman of the Center For Chemical Industries Economics Studies.

I was pleased to learn from you that you have decided not to utilize the proprietary SRI report that we supplied pursuant to subpoena. I understand the report will soon be returned to us by the court.

Very truly yours,

Geoffrey Steel
General Counsel

GS:cc

A 4986

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PRELIMINARY REPORT

1972 CENSUS OF MANUFACTURES

INDUSTRY SERIES

MC72(P)-28F-3

Issued February 1974

Industrial Organic Chemicals, N.E.C., SIC 2869

The Industrial Organic Chemicals, N.E.C., Industry includes establishments primarily engaged in manufacturing industrial organic chemicals, not elsewhere classified. Important products of this industry include (1) noncyclic organic chemicals such as acetic, chloroacetic, adipic, formic, oxalic and tartaric acids and their metallic salts; chloral, formaldehyde, and methylamine; (2) solvents such as amyl, butyl, and ethyl alcohols; methanol; amyl, butyl, and ethyl acetates; ethyl ether, ethylene glycol ether, and diethylene glycol ether; acetone, carbon disulfide, and chlorinated solvents, such as carbon tetrachloride, perchloroethylene, and trichloroethylene; (3) polyhydric alcohols, such as ethylene glycol, sorbitol, pentaerythritol, and synthetic glycerin; (4) synthetic perfume and flavoring materials, such as coumarin, methyl salicylate, saccharin, citral, citronellal, synthetic geraniol, ionone, terpineol, and synthetic vanillin; (5) rubber processing chemicals, such as accelerators and antioxidants, both cyclic and acyclic; (6) plasticizers, both cyclic and acyclic, such as esters of phosphoric acid, phthalic anhydride, adipic acid, lauric acid, oleic acid, sebacic acid, and stearic acid; (7) synthetic tanning agents, such as naphthalene sulfonic acid condensates; (8) chemical warfare gases; and (9) esters, amines, etc., of polyhydric alcohols and fatty and other acids.

Establishments primarily engaged in manufacturing plastics materials and nonvulcanizable elastomers are classified in industry 2821; synthetic rubber in industry 2822; essential oils in industry 2899; wood distillation products, naval stores, and natural dyeing and tanning materials in industry 2861; rayon and other snythetic fibers in industries 2823 and 2824; specialty cleaning, polishing, and sanitation preparations in industry 2842; paints in industry 2851; urea in industry 2873; organic pigments in industry 2865; and inorganic pigments in industry 2816. Distilleries engaged in the manufacture of grain alcohol for beverage purposes are classified in industry 2085.

The classification of establishments for which data are tabulated in this report is based upon the definitions and coding structure contained in the 1972 edition of the Standard Industrial Classification (SIC) Manual, published by the Office of Management and Budget, Executive Office of the President.

The statistics for this industry, as classified under the 1972 edition of the SIC manual, were changed to code number 2869 from code number 2818 in the previous classification system. Also the content of the industry has been slightly changed. Urea is now a part of industry 2873.

In 1972, the value of products shipped and miscellaneous receipts of establishments classified in the Industrial Organic Chemicals, N.E.C., Industry amounted to $9,035 million, an increase of 42 percent compared with 1967. Value added by manufacture at $4,922 million in 1972 was 38 percent above value added in 1967. Average employment in the industry showed an increase of 5 percent from 1967 to a total of 100 thousand employees in 1972.

Of the $9,035 million total value of shipments and other receipts of establishments classified in the Industrial Organic Chemicals, N.E.C., Industry, $2,544 million were products primary to other industries, and $328 million were receipts for miscellaneous activities. The industry shipments of primary products represented 71 percent of the total manufactured product shipments, primary and secondary. This percent, called the "specialization ratio" for the industry, was 72 percent in 1967.

For Sale by the Publications Distribution Section, Social and Economic Statistics Administration, Washington, D.C. 20233. Price: 35 cents.

CX 345 D

The total value of industrial organic chemicals, n.e.c., shipped by all producers in 1972 was 7,108 million of which 6,163 million or 83 percent was shipped by plants classified in industry 2869, Industrial Organic Chemicals, N.E.C., while the remainder was shipped by plants classified in other industries. This percentage, called the "coverage ratio," was 81 percent in 1967.

ratio," was 81 percent in 1967.

These ratios were developed to measure the extent to which the industry statistics in tables 1, 2, and 4 may be compared with the product statistics in table 3.

For an explanation of the terms used in the tables, see appendix B at the end of this report.

TABLE 1. General Statistics: 1958 to 1972

(See appendix, Explanation of Terms)

Year	Establishments		All employees		Production workers			Value added by manufacture	Cost of materials, fuels, etc.	Value of industry shipments	Capital expenditures, new	Gross value of fixed assets	End-of-year inventories	Specialization ratio	Coverage ratio
	Total	With 20 employees or more	Number	Payroll	Number	Man-hours	Wages								
	(number)	(number)	(1,000)	(million dollars)	(1,000)	(millions)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(percent)	(percent)
	INDUSTRY 2869.--INDUSTRIAL ORGANIC CHEMICALS, N.E.C.														
1972 Census	503	285	100.4	1,2[illegible] 2	63.2	127.6	698.8	4,922.3	4,118.0	9,034.6	565.2	(NA)	1,053.3	71	83
1971 ASM	(NA)	(NA)	100.2	1,110.7	63.8	129.1	649.5	4,530.8	3,656.0	8,214.3	659.4	9,409.7	1,044.2	(NA)	(NA)
1970 ASM	(NA)	(NA)	104.2	1,099.7	66.4	135.9	629.1	4,255.4	3,607.0	7,739.7	738.1	9,007.9	1,053.3	(NA)	(NA)
1969 ASM	(NA)	(NA)	101.6	1,023.[illegible]	65.7	137.4	597.4	3,976.6	3,374.6	7,253.2	711.7	8,263.0	936.7	(NA)	(NA)
1968 ASM	(NA)	(NA)	98.6	[illegible] 4	63.6	131.8	545.4	3,818.6	3,154.6	6,965.8	884.8	7,716.0	817.1	(NA)	(NA)
1967 Census	388	268	95.1	844.9	62.4	126.4	499.8	3,575.3	2,849.0	6,377.8	781.2	6,882.3	801.1	72	81
1966 ASM	(NA)	(NA)	95.7	833.3	63.6	129.0	491.6	3,641.5	2,953.1	6,541.1	886.2	(NA)	770.1	(NA)	(NA)
1965 ASM	(NA)	(NA)	91.6	768.0	61.3	125.2	462.5	3,471.7	2,615.7	6,012.5	641.2	(NA)	687.8	(NA)	(NA)
1964 ASM	(NA)	(NA)	87.5	714.0	57.0	117.6	428.6	2,990.9	2,297.1	5,265.3	496.1	(NA)	587.0	(NA)	(NA)
1963 Census	464	241	85.5	677.3	56.4	114.1	405.0	2,727.5	2,105.7	4,810.2	401.6	(NA)	552.8	72	81
1962 ASM	(NA)	(NA)	82.4	633.9	56.2	113.7	390.8	2,511.4	1,911.3	4,430.1	267.9	(NA)	515.2	(NA)	(NA)
1961 ASM	(NA)	(NA)	82.1	619.0	56.5	113.1	387.2	2,198.9	1,755.9	3,947.2	380.6	(NA)	493.7	(NA)	(NA)
1960 ASM	(NA)	(NA)	78.0	560.1	54.3	107.5	344.8	2,080.7	1,673.0	3,712.9	297.7	(NA)	461.1	(NA)	(NA)
1959 ASM	(NA)	(NA)	76.2	528.3	52.9	105.0	330.1	2,040.4	1,579.2	3,609.2	224.3	(NA)	442.4	(NA)	(NA)
1958 Census	334	165	77.4	508.4	52.0	103.9	312.4	1,725.8	1,370.1	3,098.0	330.3	(NA)	440.0	73	89

Note: "ASM" data are based on a representative sample of establishments canvassed in the Annual Survey of Manufactures (ASM). These estimates may differ from the results of a complete canvass of all manufacturing establishments.

Data prior to 1958 appear in Volume II, 1963 Census of Manufactures, in table 1 of the chapter devoted to the industry.

(NA) Not available.

TABLE 2. General Statistics, by Geographic Areas: 1972 and 1967

(See appendix, Explanation of Terms)

Geographic area	1972											1967	
	Establishments		All employees		Production workers			Value added by manufacture	Cost of materials, fuels, etc.	Value of industry shipments	Capital expenditures, new	All employees	Value added by manufacture
	Total	With 20 employees or more	Number	Payroll	Number	Man-hours	Wages						
	(number)	(number)	(1,000)	(million dollars)	(1,000)	(millions)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(1,000)	(million dollars)
	INDUSTRY 2869.--INDUSTRIAL ORGANIC CHEMICALS, N.E.C.												
United States, total	503	245	100.4	1,222.2	63.2	127.6	698.8	4,922.3	4,118.0	9,034.6	565.2	95.1	3,575.3
Northeast Region	170	95	26.9	315.2	15.9	32.3	171.0	725.4	531.9	1,658.5	97.0	26.6	586.0
New England Division	32	14	5.7	61.2	3.2	7.3	35.8	82.5	119.9	211.2	20.9	3.9	71.4
Middle Atlantic Division	138	81	21.2	254.0	12.7	25.0	135.2	642.9	412.0	1,447.3	76.0	22.7	514.6
New Jersey	75	47	13.0	168.8	7.7	15.5	90.6	443.1	564.9	1,006.0	45.3	14.8	364.4
North Central Region	101	49	15.7	190.2	9.4	18.3	102.2	599.1	458.9	1,057.3	41.4	17.3	530.4
Ohio	30	18	3.0	34.8	1.5	3.1	16.4	94.0	117.3	212.8	7.3	2.7	80.2
South Region	182	120	54.9	683.6	36.3	73.6	408.6	3,455.6	2,603.4	6,053.4	406.7	47.8	2,327.3
South Atlantic Division	67	39	13.6	147.4	9.9	20.5	102.4	717.9	440.5	1,156.2	43.9	13.5	581.9
West Virginia	14	12	9.4	106.3	7.0	14.6	77.1	549.6	268.9	822.7	30.2	9.5	467.4
South Carolina	10	6	.6	5.8	.4	.7	2.9	25.5	29.0	54.5	2.2	.5	13.3
East South Central Div.	30	18	8.2	94.8	5.4	11.9	57.6	311.3	358.5	666.3	33.4	7.2	235.7
Alabama	5	3	.4	4.9	.3	.6	3.2	29.3	30.8	57.9	.8	CC	(D)
Mississippi	3	-	.1	.5	-	.1	.3	1.3	1.4	2.9	.2	(NA)	(NA)
West South Central Div.	85	63	33.1	441.4	21.0	41.7	248.6	2,426.4	1,804.4	4,228.9	329.3	27.2	1,509.7
Texas	56	38	23.7	316.2	14.7	28.8	173.4	1,836.9	1,314.2	3,148.2	251.5	18.7	1,150.4
West Region	50	21	3.0	33.4	1.6	3.3	17.0	142.2	124.0	265.0	19.8	3.3	131.7

Note: General statistics for some producing States have to be withheld to avoid disclosing figures for individual companies. However, for some States, the employment size range for 1967 is indicated by one of the following symbols:

AA less than 250 employees
BB 250 to 499 employees
CC 500 to 999 employees
EE 1,000 to 2,499 employees
FF 2,500 employees and over

(NA) Not available. (D) Withheld to avoid disclosing figures for individual companies.

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CX 343 D

TABLE 3. Value of Shipments of Products: 1972 and 1967

(Includes value of the products reported as shipments classified in this industry, but also by establishments classified in other industries and shipping these products. Excludes [illegible])

1972 product code	Product	Total product shipments including interplant transfers (million dollars)	Commercial shipments only (million dollars)	Interplant transfers only (million dollars)	Total product shipments including interplant transfers (million dollars)	Commercial shipments only (million dollars)	Interplant transfers only (million dollars)
2869- --	INDUSTRIAL ORGANIC CHEMICALS, N.E.C., TOTAL[1]	7,407.9	(X)	(X)	5,539.4	(X)	(X)
28691 11	Miscellaneous cyclic (coal tar) chemical products[2]	459.7	411.4	48.3	315.1	271.0	44.1
28692 13	Miscellaneous acyclic chemicals and chemical products, excluding urea[1,2]	5,424.0	4,096.2	1,327.8	4,052.2	3,164.7	887.5
28693 --	Synthetic Organic Chemicals, N.E.C., Except Bulk Surface Active Agents						
28693 11	Flavor and perfume materials[2]	717.1	(X)	(X)	585.6	(X)	(X)
28693 31	Rubber-processing chemicals[2]	117.4	110.3	7.1	119.0	(D)	(D)
28693 51	Plasticizers[2]	230.6	190.2	40.2	152.3	137.1	15.2
28693 00	Synthetic organic chemicals, n.e.c., n.s.k.	363.0	306.9	56.1	309.2	283.1	26.1
		6.1	(X)	(X)	5.1	(X)	(X)
28694 11	Pesticides and other synthetic organic agricultural chemicals, except preparations[4]	489.3	434.1	55.2	308.2	242.7	65.5
28695 --	Ethyl Alcohol and Other Industrial Organic Chemicals, N.E.C.	265.8	(X)	(X)	239.4	(X)	(X)
	Ethyl alcohol:[3]						
28695 11	Pure (natural)	35.0	(D)	(D)	33.6	(D)	(D)
28695 21	Denatured (special or complete), including natural and synthetic for uses other than rubbing	39.8	(D)	(D)	44.2	(D)	(D)
28695 31	Flavor oil mixtures and blends	34.9	34.9	-	27.9	27.9	-
28695 37	Reagent and high purity grades of organic chemicals refined from purchased technical grades	22.8	21.8	1.0	19.7	19.7	-
28695 51	Natural organic chemicals, n.e.c.	57.6	(D)	(D)	44.0	(D)	(D)
28695 98	Other industrial organic chemicals	69.3	(D)	(D)	67.8	64.4	3.4
28695 00	Other industrial organic chemicals, n.s.k.	6.4	(X)	(X)	2.2	(X)	(X)
28690 00	Industrial organic chemicals, n.e.c., n.s.k., for companies with 10 employees or more. (See note.)	37.3	(X)	(X)	33.5	(X)	(X)
28690 02	Industrial organic chemicals, n.e.c., n.s.k., for companies with less than 10 employees. (See note.)	14.7	(X)	(X)	5.2	(X)	(X)

Note: In the census of manufactures, data for establishments of small companies, typically those with less than 10 employees, were estimated from administrative records rather than collected from respondents. These estimated shipments which are further discussed in the text are included in the code ending with "002." In addition to the "n.s.k." (code 002) resulting from the above, products which were not completely identified on the standard forms were coded to the appropriate product class code (5 digits) followed by "00," or in some cases to the appropriate product group code (4 digits) followed by "000."

- Represents zero. (X) Not applicable. (D) Withheld to avoid disclosing figures for individual companies. n.e.c. Not elsewhere classified. n.s.k. Not specified by kind.

[1] 1967 and 1972 figures are not comparable. The 1967 totals for code 2869213 include the values for urea. Due to revisions in the Standard Industrial Classification product classes, urea became code 2873215 in 1972.

[2] Data on quantities produced and values shipped for many of the synthetic organic chemicals included in this grouping are shown in the U.S. Tariff Commission's annual report "Synthetic Organic Chemicals, United States Production and Sales."

[3] For quantity information refer to the U.S. Treasury Department, Internal Revenue Service Publication: Alcohol and Tobacco—1972. Excludes shipments reported as rubbing alcohol (primary to industry 2834, Pharmaceutical Preparations), and as antifreeze (primary to industry 2899, Chemical Preparations, N.E.C.).

TABLE 4. Materials Consumed, by Kind: 1972 and 1967

(See appendix, Explanation of Terms)

1972 code	Material	Basis	Unit of measure	Total consumption of materials (quantity)	Consumption of materials received from other establishments: Quantity	Consumption of materials received from other establishments: Delivered cost (million dollars)	Materials made and consumed in same plant (quantity)
				1972			
	INDUSTRY 2869.--INDUSTRIAL ORGANIC CHEMICALS, N.E.C.						
	Materials, containers, and supplies, total	.....	.....	(X)	(X)	3,359.3	(X)
	Inorganic chemicals:						
	Acids, except spent acids:						
281944	Hydrochloric acid	100% HCl	1,000 s. tons.	1,324.0	395.6	14.7	928.4
281946	Hydrofluoric acid	100% HF	...do....	144.6	(D)	(D)	(D)
287311	Nitric acid	100% HNO_3	...do....	982.1	220.9	15.9	761.2
287410	Phosphoric acid	100% P_2O_5	...do....	57.1	(D)	(D)	(D)
281931	Sulfuric acid	100% H_2SO_4	...do....	1,329.3	1,167.8	24.0	161.5
287312	Ammonia, synthetic, anhydrous	100% NH_3	...do....	1,500.2	636.4	25.3	863.8
281211	Chlorine	100% Cl	...do....	6,899.8	1,785.5	76.2	5,114.3
281996	Phosphorus, elemental	Technical	...do....	59.8	(D)	(D)	(D)
281228	Sodium carbonate (soda ash)	58% Na_2O	...do....	56.7	(D)	(D)	(D)
281238	Sodium hydroxide (caustic soda)	100% NaOH	...do....	1,723.1	773.8	37.3	949.3
	Organic chemicals:						
286952	Alcohol, ethyl (pure and denatured)	.....	.....	(X)	(X)	39.7	(X)
286920	Other alcohols, including amyl, butyl, methyl, and propyl	.....	Mil. gal.	1,135.1	917.2	122.1	217.9
286511	Aniline	100%	Mil. lb.	(NA)	122.6	15.9	(NA)
286552	Benzol (benzene)	100% C_6H_6	...do....	3,168.6	2,793.0	80.0	375.6
286923	Formaldehyde	37% HCHO	...do....	2,415.0	232.4	5.1	2,182.6
	Liquefied petroleum and refinery gases for chemical feedstocks:						
291165	Ethylene	.....	...do....	11,239.8	4,752.8	154.8	6,487.0
291164	Propane	.....	...do....	(NA)	7,791.6	98.2	(NA)
291166	Propylene	.....	...do....	3,843.5	2,043.4	54.6	1,800.1
291169	Other, including mixtures	.....	...do....	(NA)	7,081.6	117.5	(NA)
286565	Naphthalene	.....	...do....	612.8	612.8	27.8	-
286513	Phenol	100%	...do....	464.4	(D)	(D)	(D)
286514	Phthalic anhydride	100%	...do....	443.7	151.9	11.2	291.8
	Crude materials:						
147701	Sulfur	.....	1,000 l. tons.	(X)	477.0	13.4	(X)
	Used as raw materials:						
131152	Natural gas	.....	Mil.cu.ft.	(X)	254,187.0	70.3	(X)
355911	Parts and attachments for chemical industries, machinery, and equipment	.....	.....	(X)	(X)	115.4	(X)
970099	All other materials and components, parts, containers, and supplies consumed	.....	.....	(X)	(X)	2,096.1	(X)
976000	Materials, containers, and supplies, n.s.k.[1]	.....	.....	(X)	(X)	80.6	(X)
				1967			
	Materials, containers, and supplies, total	.....	.....	(X)	(X)	2,398.1	(X)
	Inorganic chemicals:						
	Acids, except spent acids:						
281944	Hydrochloric acid	100% HCl	1,000 s. tons.	(S)	(S)	13.8	(S)
281946	Hydrofluoric acid	100% HF	...do....	92.4	60.3	16.5	32.1
287311	Nitric acid	100% HNO_3	...do....	(S)	(S)	14.1	(S)
287410	Phosphoric acid	100% P_2O_5	...do....	(NA)	(NA)	(Z)	(NA)
281931	Sulfuric acid	100% H_2SO_4	...do....	1,702.0	1,112.6	24.1	589.5
287312	Ammonia, synthetic, anhydrous	100% NH_3	...do....	1,203.7	510.2	23.8	693.5
281211	Chlorine	100% Cl	...do....	4,594.6	1,505.4	71.9	3,089.2
281996	Phosphorus, elemental	Technical	...do....	17.3	10.5	3.2	6.8
281228	Sodium carbonate (soda ash)	58% Na_2O	...do....	56.5	48.0	2.0	8.5
281238	Sodium hydroxide (caustic soda)	100% NaOH	...do....	(S)	613.7	27.8	(S)
	Organic chemicals:						
286952	Alcohol, ethyl (pure and denatured)	.....	.....	(X)	(X)	41.4	(X)
286920	Other alcohols, including amyl, butyl, methyl, and propyl	.....	Mil. gal.	(NA)	(NA)	88.2	(NA)
286511	Aniline	100%	Mil. lb.	79.5	79.5	9.5	-
286552	Benzol (benzene)	100% C_6H_6	...do....	1,225.7	(D)	(3)	(D)
286923	Formaldehyde	37% HCHO	...do....	1,238.8	102.2	3.0	1,136.7
	Liquefied petroleum and refinery gases for chemical feedstocks:						
291165	Ethylene	.....	...do....	7,208.8	2,547.5	97.9	4,661.3
291164	Propane	.....	...do....	(S)	(S)	35.2	-
291166	Propylene	.....	...do....	2,604.4	1,841.3	41.0	763.2
291169	Other, including mixtures	.....	...do....	(NA)	(NA)	103.3	(NA)

See footnotes at end of table.

TABLE 4. Materials Consumed, by Kind: 1972 and 1967—Continued

(See appendix, Explanation of Terms)

1972 code	Material	Basis	Unit of measure	Total consumption of materials (quantity)	Consumption received from reporting establishments: Quantity	Consumption received from reporting establishments: Delivered cost (million dollars)	Materials consumed in same plant (quantity)
	INDUSTRY 2869.--INDUSTRIAL ORGANIC CHEMICALS, N.E.C.--Con.			1967			
	Materials, containers, and supplies--Continued						
	Organic chemicals--Continued						
286555	Naphthalene	.....	...do.....	397.2	397.2	17.6	-
286510	Phenol	100	...do.....	487.7	344.2	30.7	143.5
286514	Phthalic anhydride	100	...do.....	297.6	124.0	12.8	173.6
	Crude materials:						
117701	Sulfur	.....	1,000 l tons.	665.0	665.0	22.6	-
	Used as raw materials:						
111152	Natural gas	.....	Mil.cu.ft.	(S)	(S)	62.0	-
355911	Parts and attachments for chemical industries, machinery, and equipment	.....	.....	(X)	(X)	(X)	(X)
970099	All other materials and components, parts, containers, and supplies consumed	.....	.....	(X)	(X)	[1]1,434.8	(X)
936000	Materials, containers, and supplies, n.s.k. [2]	.....	.....	(X)	(X)	200.3	(X)

- Represents zero. (X) Not applicable. (NA) Not available. (D) Withheld to avoid disclosing figures for individual companies. In some cases figures which are otherwise publishable are withheld to avoid indirect disclosure by subtraction from higher-level totals or from related figures. (S) Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error or on the basis of a consistency review. (Z) Less than 0.1 when rounded. n.s.k. Not specified by kind.

[1] This item represents the total cost of materials for establishments that did not report detailed materials data. It also includes estimates for companies that were not mailed report forms.

[2] Code 286552 combined with code 970099 for 1967.

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Appendix A. SCOPE AND COVERAGE

This report is one of a series presenting preliminary information on industries and products from the 1972 Census of Manufactures. The data will be superseded in a final report which in turn will be included in *Volume II, Industry Statistics, 1972 Census of Manufactures.* The final report will include a comprehensive discussion of the concepts and definitions used in the census.

The census of manufactures covers each manufacturing establishment in the United States with one paid employee or more; manufacturing establishments with no employees are excluded from this census. Firms which operate more than one establishment were required to file a separate report for each location. Companies which engaged in distinctly different lines of activity at one location were asked to submit separate reports if the company records permitted such a separation and the activities were of significant size.

This report does not include figures for administrative offices, warehouses, garages, or other auxiliary units which service manufacturing establishments of the same company.

In the 1972 census, as in the 1967 census, approximately 120,000 manufacturing firms with less than 10 employees were excused from filing reports. Under special arrangements which safeguarded the confidentiality of both tax and census records, limited data (payrolls, sales, and industry classification) from the administrative records of the Social Security Administration (SSA) and the Internal Revenue Service (IRS) were made available to the Census Bureau for use in the 1972 Economic Censuses (Retail and Wholesale Trade, Service Industries, Construction Industries, Manufactures, and Mineral Industries). Estimates for data other than payrolls and sales for these small establishments were developed from industry averages. The effect on industry aggregates is slight in most industries. For manufacturing as a whole, they account for less than 3 percent of the payrolls and value added. In industry 2869, these small establishments accounted for approximately 0.2 percent of payrolls and 0.2 percent of value added by manufacture. Detailed product and materials data for these small establishments were not estimated. The entire estimated value of shipments and cost of materials were imputed to "not specified by kind" categories.

As in earlier censuses, a number of small establishments may have been misclassified as to industry. However, such possible misclassifications have no significant effect on the statistics other than the number of establishments. As indicated above, report forms were not mailed to very small establishments (less than 10 employees). The industry classifications for these establishments were assigned on the basis of brief descriptions of the general activity of the establishment.

Where the description is incomplete or there are relatively fine lines of demarcation among industries or between manufacturing and nonmanufacturing activity, the code assigned to an establishment could differ from that which would have been assigned on the basis of more complete product or activity information. Therefore, the total establishment count should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the total number of establishments.

The general statistics (employment, payrolls, cost of materials, value added by manufacture, value of shipments) appearing in tables 1, 2 and 4 are reported for each establishment as a whole. Thus, these data reflect not only the primary activities of the establishments, which determine their industry classification, but also all secondary activities as well. This fact should be taken into consideration when comparing the data in tables 1, 2, and 4 with the value of products appearing in table 3. The data in table 3 provide information on the value of the primary products of the industry shipped by all manufacturing establishments whether they are classified in the industry or in other industries and producing the products as secondary products.

More detailed figures for this industry will appear in the final census reports. Final reports will also include a comprehensive discussion of such concepts as "industry," "establishments," and "secondary production," as well as the various statistical items such as "employment," and "value added." Similar preliminary and final reports will be issued for other industries during the coming months. A series of preliminary summary reports showing U.S. totals for each manufacturing industry and for each State are being issued. Final industry reports and final area reports will be published during 1974.

Order forms showing these reports and their prices may be obtained from any U.S. Department of Commerce district office or from the Publications Distribution Section, Social and Economic Statistics Administration, Washington, D.C., 20233.

The 1972 Census of Manufactures is the 29th census of manufacturing establishments in the United States. For 1972, it was conducted jointly with the censuses of mineral industries, construction industries, retail trade, wholesale trade, and selected services under authority of Title 13 of the United States Code. Title 13 specifies that a census of manufactures be conducted every 5 years, to cover years ending in "2" and "7". Title 13 also authorizes an annual sample survey of manufacturing establishments in interim years.

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Appendix B. EXPLANATION OF TERMS

(For a more complete discussion of these terms and the method of compiling the Census of Manufactures, see the "Introduction" to the 1967 Census of Manufactures, Volume III).

All Employees—All full-time and part time employees on the payrolls of operating manufacturing establishments for any part of the pay period ended nearest the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employee" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average of those for midmonth payroll periods of March, May, August, and November.

Payroll—This item includes all forms of compensation such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of these establishments if a corporation; it excludes payments to the proprietor or partners, if an unincorporated concern. Respondents were told that in reporting they could follow the definition of payrolls used for calculating the Federal withholding tax.

Production and Related Worker Man-Hours—This total relates to production worker man-hours worked or paid for at the plant including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave when the employee was not at the plant.

Cost of Materials—The term "cost of materials" refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed regardless of whether these items were purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (a) all raw material, semifinished goods, parts, components, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (b) electric energy purchased, (c) fuels consumed for heat, power, or the generation of electricity; (d) work done by others on materials or parts furnished by manufacturing establishments (contract work); and (e) products bought and resold in the same condition.

Specific Materials Consumed—In addition to the total cost of materials which every establishment was required to report, information was also collected for many manufacturing industries on the consumption of major materials used in manufacturing. These materials inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Information regarding the specific materials consumed is shown in table 4, if appropriate to this industry. Establishments consuming less than a specified amount (usually $5,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which administrative records used were imputed as "not specified by kind." (See "Scope and Coverage" for importance of administrative records in the industry.)

Value of Shipments—The amounts under value of shipments are the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts such as receipts for contract work performed for others, installation and repair, sales of scrap, and sale of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value; i.e., including not only the direct costs of production but also a reasonable proportion of "all other costs" (including company overhead) and profit.

Shipment of Individual Products—In the 1972 census program, more detailed shipment information was collected on the output of approximately 10,000 individual products. These products are identified by a 7-digit code and are grouped into approximately 1,200 classes of products which in turn are primary to about 450 4-digit industries. Data at the 5-digit product-class

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level have been collected each year as part of the Annual Survey of Manufactures. Information at the 7-digit level is collected in the quinquennial Census of Manufactures program and, for many industries, in the Current Industrial Reports program of the Bureau.

Typically, both quantity and value of shipments information were collected. However, if there was no meaningful physical quantity measure that could be reported by manufacturers, only value of shipments was collected. Insofar as other measures were collected for selected products, they are shown in table 3.

Value Added by Manufacture—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments for products manufactured plus receipts for services rendered. The result of this calculation is then adjusted by the net change in finished goods and work-in-process inventories between the beginning and end of the year.

"Value added" avoids the duplication in the value of shipments figure which results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

Expenditures for Plant and Equipment—For establishments in operation and establishments under construction but not yet in operation, manufacturers were asked to report their expenditures for (a) permanent additions and major alterations to manufacturing establishments, and (b) new machinery and equipment used for replacement purposes and additions to plant capacity if they are of the type for which depreciation accounts are ordinarily maintained.

These totals exclude that portion of expenditures for new facilities and equipment leased from nonmanufacturing concerns, new facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations. Expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses are also omitted from the figures for new capital expenditures.

End-of-Year Inventories—Respondents were asked to report their inventories at approximate current costs if feasible; otherwise, at book values. Since different methods of inventory valuation are used (LIFO, FIFO, etc.), the definition of the value of the inventories aggregated for all establishments in an industry is not precise. The figures on change in inventory between years are of considerably greater significance than the measurement of the level of inventories.

Gross Value of Fixed Assets—This statistic is included with the basic general statistics for the first time in the 1972 Census of Manufactures. The information, however, is collected in the annual survey of manufactures sample and is thus subject to sampling error. The sampling errors will be included in the special census report on Gross Book Value of Depreciable Assets and Rental Payments. Approximate sample errors for 1972 can also be obtained from the 1971 Annual Survey of Manufactures. The data cover all fixed assets on the books of establishments at the end of the year for which depreciation accounts are maintained. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all buildings, structures, and machinery and equipment. Excluded are nondepreciable assets; for example, inventories and intangible assets such as patent rights and royalties. Also excluded are land and depletable assets such as timber and mineral rights.

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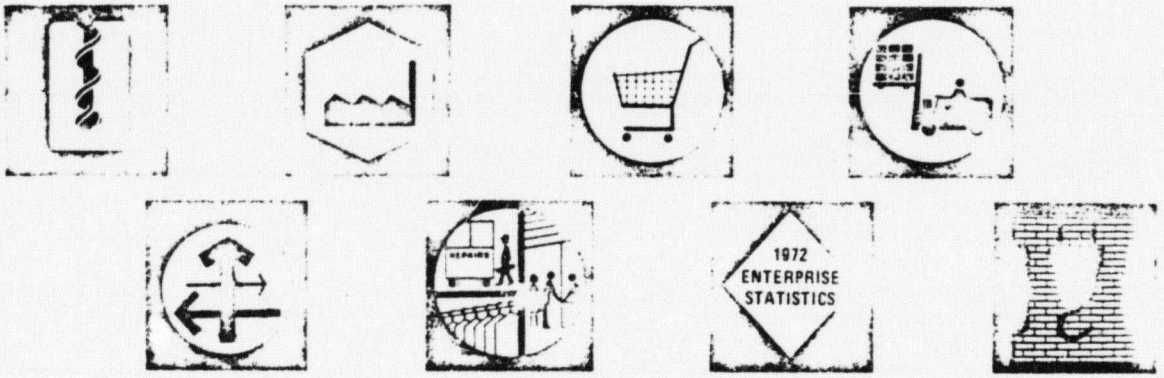

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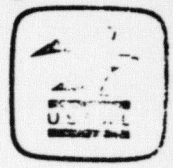

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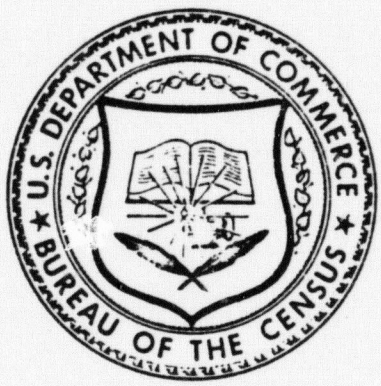

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A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PRELIMINARY REPORT

1972 CENSUS OF MANUFACTURES

INDUSTRY SERIES

MC72(P)-29A-1
Issued January 1974

Petroleum Refining; Lubricating Oils and Greases;

SIC 2911 and SIC 2992

The Petroleum Refining Industry includes establishments primarily engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants and other products from crude petroleum and its fractionation products, through straight distillation of crude oil, redistillation of unfinished petroleum derivatives, cracking or other processes. Establishments primarily engaged in producing natural gasoline from natural gas are classified in mining industries. Establishments primarily engaged in re-refining used lubricating oils are classified in industry 2992. These establishments were classified in 2911 in 1967 and prior years.

The Lubricating Oils and Greases Industry includes establishments primarily engaged in blending, compounding, and re-refining lubricating oils and greases from purchased mineral, animal, and vegetable materials.

The classification of establishments for which data are tabulated in this report is based upon the definitions and coding structure contained in the 1972 edition of the Standard Industrial Classification (SIC) Manual, published by the Office of Management and Budget, Executive Office of the President.

The code numbers for these industries in the 1972 revision of the SIC is unchanged, but the content of the industries has been slightly changed from the previous classification system.

In 1972, the value of products shipped and miscellaneous receipts of establishments classified in the Petroleum Refining Industry amounted to $25,883 million, an increase of 28 percent compared with 1967. Value added by manufacture at $4,628 million in 1972 was 3 percent below value added in 1967. Average employment in the industry showed a decrease of 6 percent from 1967 to a total of 101 thousand employees in 1972.

Of the $25,883 million total value of shipments and other receipts of establishments classified in the Petroleum Refining Industry, $900 million were products primary to other industries, and $513 million were receipts for miscellaneous activities. The industry shipments of primary products represented 96 percent of the total manufactured product shipments, primary and secondary. This percent, called the "specialization ratio," for the industry, was 98 percent in 1967.

The total value of petroleum products shipped by all producers in 1972 was $25,368 million of which $24,470 million or 96 percent was shipped by plants classified in industry 2911, Petroleum Refining, while the remainder was shipped by plants classified in other industries. This percentage, called the "coverage ratio," was 97 percent in 1967.

In 1972, the value of products shipped and miscellaneous receipts of establishments classified in the Lubricating Oils and Greases Industry amounted to $697 million, an increase of 43 percent compared with 1967. Value added by manufacture at $292 million in 1972 was 45 percent above value added in 1967. Average employment in the industry showed an increase of 10 percent from 1967 to a total of 8 thousand employees in 1972.

Continued on page 2.

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Of the [illegible] million total value of shipments and other receipts of establishments classified in the Lubricating Oils and Greases Industry, [illegible] million were products primary to other industries, and $54 million were receipts for miscellaneous activities. The industry shipments of primary products represented 93 percent of the total manufactured product shipments, primary and secondary. This percent, called the "specialization ratio," for the industry, was 94 percent in 1967.

The total value of lubricating oils and greases shipped by all producers in 1972 was $1,503 million of which $599 million or [illegible] percent was shipped by plants classified in industry 2992, Lubricating Oils and Greases, while the remainder was shipped by plants classified in other industries. This percentage, called the "coverage ratio," was 32 percent in 1967.

These ratios were developed to measure the extent to which the industry statistics in tables 1, 2, and 4 may be compared with the product statistics in table 3.

For an explanation of the terms used in the tables, see appendix B at the end of this report.

TABLE 1. General Statistics: 1958 to 1972

(See appendix, Explanation of Terms)

Year	Establishments		All employees		Production workers			Value added by manufacture	Cost of materials, fuels, etc.	Value of industry shipments	Capital expenditures, new	Gross value of fixed assets	End-of-year inventories	Specialization ratio	Coverage ratio
	Total	With 20 employees or more	Number	Payroll	Number	Man-hours	Wages								
	(number)	(number)	(1,000)	(million dollars)	(1,000)	(millions)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(percent)	(percent)
	INDUSTRY 2911.--PETROLEUM REFINING														
1972 Census	316	273	100.6	1,244.8	71.0	141.9	814.0	4,627.5	21,124.1	25,883.3	1,066.5	(NA)	2,000.3	96	96
1971 ASM	(NA)	(NA)	106.7	1,230.0	74.3	148.7	794.1	4,613.8	20,091.9	24,583.7	1,232.3	15,798.2	2,228.6	(NA)	(NA)
1970 ASM	(NA)	(NA)	107.7	1,161.2	75.4	152.7	753.3	4,607.0	18,258.1	22,763.3	1,151.9	14,771.7	2,130.8	(NA)	(NA)
1969 ASM	(NA)	(NA)	108.0	1,090.8	75.6	146.5	685.7	4 949.8	17,567.6	22,486.4	1,023.4	13,814.3	2,028.6	(NA)	(NA)
1968 ASM	(NA)	(NA)	107.1	1,024.9	75.4	152.3	665.5	4,838.8	16,555.3	21,361.2	1,019.3	12,958.9	1,976.8	(NA)	(NA)
1967 Census	437	287	106.7	965.0	75.6	151.6	632.2	4,745.0	15,683.7	20,293.9	956.3	12,111.8	1,904.3	98	97
1966 ASM	(NA)	(NA)	105.5	897.3	75.5	149.9	597.5	4,099.2	14,640.9	18,758.7	630.7	(NA)	1,718.3	(NA)	(NA)
1965 ASM	(NA)	(NA)	108.7	887.4	78.1	153.8	592.8	3,493.3	14,001.4	17,500.9	565.3	(NA)	1,680.0	(NA)	(NA)
1964 ASM	(NA)	(NA)	113.3	905.9	81.6	162.1	605.0	3,192.2	13,606.3	16,802.4	384.3	10,289.1	1,678.4	(NA)	(NA)
1963 Census	427	297	118.3	923.3	85.2	166.4	614.3	3,138.2	13,367.3	16,497.5	385.1	10,096.5	1,695.5	98	97
1962 ASM	(NA)	(NA)	122.9	906.6	87.8	173.3	603.0	2,965.5	12,979.5	15,914.1	433.3	9,801.3	1,712.1	(NA)	(NA)
1961 ASM	(NA)	(NA)	128.7	937.1	92.4	182.2	629.8	2,929.2	12,734.2	15,618.6	459.3	(NA)	1,632.8	(NA)	(NA)
1960 ASM	(NA)	(NA)	134.9	935.8	97.3	192.4	635.2	2,773.4	12,713.4	15,505.1	455.5	(NA)	1,604.8	(NA)	(NA)
1959 ASM	(NA)	(NA)	137.1	944.3	100.1	196.0	645.1	2,458.2	12,621.9	15,090.1	407.7	(NA)	1,643.0	(NA)	(NA)
1958 Census	416	313	146.0	944.3	106.9	207.6	648.3	2,119.4	12,249.4	14,539.1	656.8	(NA)	1,572.9	98	98
	INDUSTRY 2992.--LUBRICATING OILS AND GREASES														
1972 Census[2]	433	115	8.0	82.4	4.3	8.6	36.0	291.6	406.8	696.7	14.8	(NA)	80.8	93	40

Note: "ASM" data are based on a representative sample of establishments canvassed in the Annual Survey of Manufactures (ASM). These estimates may differ from the results of a complete canvass of all manufacturing establishments. The 1971 ASM percentage standard errors of estimate for employment and value added were 1 and 1, respectively. Standard errors of estimate for other years are published in the ASM report for that period. For comparative purposes, the 1972 ASM estimate for industry 2911 was 101 thousand employees and $4,731 million in value added with corresponding standard errors of estimate of 1 and 1.

Data prior to 1958 appear in Volume II, 1963 Census of Manufactures, in table 1 of the chapter devoted to the industry.

(NA) Not available.

[1]Re-refiners classified in 2992 due to a revision in the 1972 Standard Industrial Classification Manual.

[2]Data for previous years not shown due to the reclassification of re-refiners into this industry in 1972.

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TABLE 2. General Statistics, by Geographic Areas: 1972 and 1967

(See appendix, Explanation of Terms)

Geographic area	1972											1967	
	Establishments		All employees		Production workers			Value added by manufacture	Cost of materials, fuels, etc.	Value of industry shipments	Capital expenditures, new	All employees	Value added by manufacture
	Total	With 20 employees or more	Number	Payroll	Number	Man hours	Wages						
	(number)	(number)	(1,000)	(million dollars)	(1,000)	(millions)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(million dollars)	(1,000)	(million dollars)
INDUSTRY 2911.--PETROLEUM REFINING													
United States, total.	316	273	100.6	1,244.8	71.0	141.9	814.0	4,627.4	21,124.1	25,883.3	1,068.5	106.7	4,745.0
Northeast Region.....	37	28	13.6	161.5	9.8	18.6	111.5	533.3	2,367.0	3,123.7	157.0	14.7	439.3
Pennsylvania.....	18	15	8.7	97.3	6.3	11.7	69.7	255.3	1,301.8	1,574.8	104.1	9.9	256.5
North Central Region.....	66	60	21.5	269.6	15.0	31.1	170.5	1,075.2	4,718.0	5,820.6	270.1	23.4	1,011.7
East North Central Div.	46	40	16.9	211.3	11.6	23.9	135.3	810.7	3,675.1	4,506.3	241.6	18.2	732.3
Ohio.....	15	12	3.5	44.3	2.5	5.2	30.4	217.4	1,043.4	1,260.1	42.7	3.3	160.5
Indiana.....	7	7	5.2	69.4	3.4	7.3	40.2	183.8	904.2	1,102.8	32.8	6.3	197.e
Illinois.....	13	12	6.4	79.0	4.6	9.1	52.6	277.6	1,387.8	1,666.2	125.4	6.5	295.2
West North Central Div.	20	20	4.6	55.3	3.4	7.2	35.2	264.5	1,042.9	1,314.3	28.6	5.2	282.4
Kansas.....	12	12	2.6	31.0	2.2	4.5	21.4	146.3	606.5	758.8	20.7	FF	(D)
South Region.....	133	117	47.2	583.3	33.7	68.4	386.3	2,115.4	10,100.3	12,321.1	452.1	49.1	2,500.0
South Atlantic Division	17	12	1.8	22.5	1.2	2.7	13.8	165.4	372.0	540.5	28.7	1.7	119.3
East South Central Div.	15	15	2.2	25.7	1.5	3.2	17.7	128.0	685.7	817.5	24.7	1.8	116.5
Alabama.....	3	5	.*	3.3	.2	.5	2.4	13.7	44.2	58.3	1.0	BB	(D)
West South Central Div.	101	90	43.2	535.1	31.0	62.5	354.8	1,822.0	9,042.6	10,963.4	398.8	45.6	2,264.2
Louisiana.....	26	23	8.6	112.8	5.5	11.3	65.4	400.9	2,436.2	2,841.0	179.2	9.0	326.9
Texas.....	57	52	30.2	375.4	22.0	44.4	253.6	1,327.0	5,864.1	7,268.8	(D)	31.0	1,765.1
West Region.....	80	68	18.2	230.4	12.5	23.8	145.8	903.5	3,738.8	4,617.5	187.5	19.4	790.9
Mountain Division.....	29	24	3.3	40.4	2.6	5.3	28.5	157.8	671.1	828.4	25.7	4.2	156.1
Wyoming.....	10	7	1.3	15.1	1.1	2.1	11.1	51.9	204.4	254.3	9.1	1.7	36.4
Utah.....	5	1	.6	7.6	.5	1.1	5.4	41.9	162.2	206.5	4.7	.9	49.5
Pacific Division.....	51	44	14.9	190.0	9.9	18.6	117.3	745.7	3,067.7	3,789.1	161.7	15.2	634.8
California.....	37	33	13.2	166.0	8.8	16.4	103.7	629.5	2,499.0	3,117.8	100.8	13.9	496.6
INDUSTRY 2992.--LUBRICATING OILS AND GREASES[1]													
United States, total.	433	115	8.0	82.4	4.3	8.6	36.0	291.6	406.8	696.7	14.8	(NA)	(NA)
Middle Atlantic Division.	85	33	2.4	27.2	1.3	2.6	11.8	81.2	114.5	196.6	(D)	(NA)	(NA)
New Jersey.....	22	10	.6	7.1	.4	.7	3.6	31.1	48.5	80.5	1.5	(NA)	(NA)
North Central Region.....	143	45	2.9	30.8	1.5	3.1	13.4	138.7	157.8	295.4	5.2	(NA)	(NA)
Ohio.....	31	8	.5	6.0	.2	.4	2.1	20.6	25.0	45.8	.8	(NA)	(NA)
Illinois.....	30	11	.8	10.1	.4	.8	4.0	41.3	53.6	95.1	1.0	(NA)	(NA)
Michigan.....	24	7	.4	3.9	.2	.4	1.6	20.3	14.8	35.1	.6	(NA)	(NA)
Iowa.....	4	2	.1	.7	-	.1	.2	2.4	2.1	4.5	.2	(NA)	(NA)
Missouri.....	12	3	.3	2.3	.2	.4	1.5	18.1	22.7	40.2	.1	(NA)	(NA)
Kansas.....	8	4	.3	2.6	.2	.4	1.5	12.4	11.9	24.0	.5	(NA)	(NA)
South Region.....	115	22	1.7	14.2	.9	2.0	6.5	39.3	96.2	134.5	2.6	(NA)	(NA)
West South Central Div.	72	12	1.1	9.4	.6	1.3	4.3	27.3	77.6	103.8	(D)	(NA)	(NA)

Note: General statistics for some producing States have to be withheld to avoid disclosing figures for individual companies. However, for each State, the employment size range for 1967 is indicated by one of the following symbols:

AA	less than 250 employees	EE	1,000 to 2,499 employees
BB	250 to 499 employees	FF	2,500 employees and over
CC	500 to 999 employees		

(NA) Not available. (D) Withheld to avoid disclosing figures for individual companies.

[1]Comparable data for 1967 are not available due to revisions in the Standard Industrial Classification.

TABLE 3 Quantity and Value of Products: 1972 and 1967

[Includes quantity and value of products reported by establishments classified in the Petroleum Refining industry (SIC 2911) and by establishments classified in other industries and in miscellaneous industries (SIC 3999). Totals may not add because of rounding]

1972 product code	Product	Unit of measure	1972			1967		
			Receipts[1]	Total product shipments including interplant transfers	Net shipments[2]	Receipts[1]	Total product shipments including interplant transfers	Net shipments[2]
				Quantity	Value (excluding tax) (million dollars)		Quantity	Value (excluding tax) (million dollars)
2911 -- 2982 --	PETROLEUM PRODUCTS, TOTAL		(X)	(X)	25,367.9	(X)	(X)	19,691.9	(X)
29111 --	Gasoline	Mil.bbl.	(NA)	2,394.0	13,018.7	(NA)	1,880.1	9,844.2	(NA)
29111 11	Aviation gasoline, except jet fuel	do.	(S)	53.6	305.5	(S)	47.6	278.8	(S)
29111 31	Motor gasoline	do.	41.0	2,340.4	12,711.2	2,261.0	22.2	1,832.5	[4]9,565.4	1,810.3
29111 48	Other finished gasolines, including finished base[3]	do.	-	-	-	-	(X)	(X)	[4]	(X)
29111 00	Gasoline, n.s.k.		(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
29112 --	Jet Fuel	Mil.bbl.	8.9	311.1	1,367.9	292.7	2.8	275.2	1,100.4	272.4
29112 11	Naphtha type	do.	2.3	66.8	279.3	61.6	.1	107.0	437.9	106.9
29112 13	Kerosine type	do.	6.6	244.3	1,088.6	231.1	2.7	168.2	662.5	165.5
29112 00	Jet fuel, n.s.k.		(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
29113 --	Kerosene									
29113 11	Kerosene, except jet fuel	Mil.bbl.	4.4	81.6	371.3	77.2	5.1	103.0	430.5	97.9
29114 --	Distillate Fuel Oil									
29114 11	Distillate fuel oil, including grades No. 1, 2, and 4 light diesel-type, light gas-enrichment oils, etc.	do.	18.8	1,041.5	4,414.9	1,011.8	19.8	871.1	3,305.7	851.3
29115 --	Residual Fuel Oil									
	Residual fuel oil, including grades No. 5 and 6, heavy diesel-type, heavy gas-enrichment oils, etc.	do.	61.7	338.5	1,110.7	265.2	25.7	277.0	566.1	251.3
29116 --	Liquefied Refinery Gases (Feedstock and Other Uses)	do.	(S)	(S)	1,159.6	(S)	(S)	(S)	1,135.7	(S)
	Chemical raw material, including synthetic rubber components:									
29116 11	Liquefied refinery gases	do.	(S)	(S)	587.9	(S)	(S)	(S)	624.9	(S)
29116 31	Other aliphatics, including feedstock mixtures	do.	(S)	(S)	389.6	(S)	(S)	(S)	362.6	(S)
	Other uses:									
29116 51	Liquefied refinery gases	do.	(S)	(S)	182.1	(S)	(S)	(S)	119.1	(S)
29116 71	Other aliphatics	do.					(S)	(S)	29.2	(S)
29116 00	Liquefied refinery gases, n.e.c.		(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
29118 --	Unfinished Oils and Lubricating Oil Base Stock[5]	Mil.bbl.	(NA)	(NA)	734.6	(NA)	130.4	141.9	613.2	22.9
	Unfinished oils:[6]									
29118 12	Naphthenic oils	do.	50.2	22.5	89.4	23.7	109.6	104.0	324.1	5.6
29118 14	Paraffinic oils	do.	26.6	44.7	163.2	18.1				
29118 15	Naphtha and other oils for use as petrochemical feedstocks	do.	8.6	41.4	154.9	32.8	6.0	13.3	83.5	7.3
	Lubricating oil petroleum base stocks (for blending, compounding, and grease manufacture):[6]									
29118 53	Naphthenic oils	do.	.3	10.6	107.2	10.3	14.8	24.6	205.6	9.8
29118 55	Paraffinic oils	do.	7.0	21.4	219.1	14.4	(NA)	(NA)	(NA)	(NA)
29118 00	Unfinished oils and lubricating oil base stock, n.s.k.		(NA)	(NA)	.8	(NA)	(NA)	(NA)	(NA)	(NA)
29119 --	Asphalt	Mil.bbl.	(NA)	(NA)	660.4	(NA)	4.6	138.5	424.2	133.9
29119 11	200 penetration and over, including emulsified asphalt produced at the refinery[7]	do.	45.1	46.2	181.5	1.1	.2	43.3	134.2	43.1
29119 51	Less than 200 penetration[8]	do.	10.4	117.0	473.4	106.6	4.4	95.2	289.9	90.6
29119 00	Asphalt, n.s.k.		(X)	(X)	5.5	(X)	(NA)	(NA)	(NA)	(NA)
29110 --	Other Finished Petroleum Products, Including Waxes	Mil.bbl.	(X)	(X)	[9]1,028.8	(X)	(X)	(X)	[11]944.9	(X)
29110 11	Petrolatum	do.	.5	2.0	34.8	1.5	.4	3.6	44.4	3.2
29110 21	Petroleum coke	1,000 s.tons.	(S)	(S)	128.4	(S)	(S)	(S)	85.6	(S)
29110 31	Road oil[12]	Mil.bbl.	(S)	8.4	33.9	(S)	(D)	6.8	23.5	(S)
29110 41	Still gas	Million cu. ft.	-	23.5	16.8	23.5	(S)	(S)	7.0	(S)
29110 51	Special naphthas[13]	Mil.bbl.	.3	16.0	77.8	15.1	.7	15.4	87.5	14.7
29110 55	Aromatics	do.	-	66.0	489.1	64.5	(S)	82.4	463.0	(S)
	Wax									
29110 61	Microcrystalline[14]	do.	(S)	1.8	32.7	(S)	.2	1.5	30.5	1.3
29110 71	Crystalline, fully refined	do.	.1	3.9	56.2	3.8	.1	3.2	44.8	3.1
29110 81	Crystalline, other	do.	(S)	(S)	20.0	(S)	-	1.4	20.8	1.4
29110 99	Other finished petroleum products	do.	(S)	(S)	106.8	(S)	(S)	(S)	94.4	(S)

See footnotes at end of table.

TABLE 3 Quantity and Value of Products: 1972 and 1967—Continued

(Includes quantity and value of the products reported not only by establishments classified in this industry, but also by establishments classified in other industries and reporting these products as secondary products. See appendix B for explanation of terms. "Value of shipments.")

1972 product code	Product	Unit of measure	1972			1967		
			Receipts[1]	Total product shipments including interplant transfers	Net shipments[2]	Receipts[1]	Total product shipments including interplant transfers	Net shipments[2]
				Quantity / Value (excluding tax) (million dollars)			Quantity / Value (excluding tax) (million dollars)	
2911- -- 2992- --	PETROLEUM PRODUCTS—Continued							
29110 00	Products of petroleum refining, n.s.k., for companies with 10 employees or more. (See note.)	.....	(X)	(X) / [11]32.3	(X)	(X)	(X) / [11]38.6	(X)
29110 02	Products of petroleum refining, n.s.k., for companies with less than 10 employees. (See note.)	.....	(X)	(X) / -	(X)	(X)	(X) / [11]4.9	(X)
29117 --	Lubricating oils and greases	.....	(X)	(X) / 1,503.0	(X)	(X)	(X) / 1,327.0	(X)
29920 --	Lubricants and similar oils[13]	Mil.bbl.	10.3	66.8 / 1,277.8	56.5	3.6	65.9 / 1,183.3	62.3
29117 21	Made in petroleum refineries	...do...	4.2	49.2 / 825.8	44.9	1.6	52.1 / 829.5	50.5
29920 21	Made in lubricating oils and greases industry	...do...	6.1	17.7 / 452.0	11.6	2.0	13.8 / 354.0	11.8
	Made in other manufacturing industries	...do...						
	Lubricating greases[14]	...do...	.3	3.5 / 123.0	3.2	.1	3.5 / 120.6	3.4
29117 31	Made in petroleum refineries	...do...	.1	1.9 / 51.5	1.8	--	2.1 / 54.1	2.1
29920 31	Made in lubricating oils and greases industry	...do...	.2	1.6 / 71.5	1.4	1	1.4 / 66.3	1.3
	Made in other manufacturing industries	...do...						
29920 00	Lubricating oils and greases, n.s.k., for companies with 10 employees or more. (See note.)	.....	(X)	(X) / 77.3	(X)	(X)	(X) / 16.7	(X)
29920 02	Lubricating oils and greases, n.s.k., for companies with less than 10 employees. (See note.)	.....	(X)	(X) / 24.7	(X)	(X)	(X) / 6.2	(X)

Note. In the census of manufactures, data for establishments of small companies, typically those with less than 10 employees, were estimated from administrative records rather than collected from respondents. These estimated shipments which are further discussed in the appendix are included in the code ending with "002." In addition to the "n.s.k." (code 002) resulting from the above, products which were not completely identified on the standard forms were coded to the appropriate product class code (5 digits) followed by "00," or in some cases to the appropriate product group code (4 digits) followed by "000."

- Represents zero. (X) Not applicable. (NA) Not available. (D) Withheld to avoid disclosing figures for individual companies. In some cases figures which are otherwise publishable are withheld to avoid indirect disclosure by subtraction from higher-level totals or from related figures. (S) Withheld because the estimate did not meet publication standards, either on the basis of the associated standard error of estimate or on the basis of a consistency review. n.s.k. Not specified by kind.

[1]Reporting companies were requested to classify items in the same manner as billed by the shipper regardless of how the refinery (or blending and compounding establishments) would otherwise classify them.

[2]Represents the difference between "Total shipments" (Quantity) and "Receipts" (Quantity).

[3]Includes all finished gasolines (other than aviation and automotive gasoline), finished base stocks, and blending agents such as alkylate, polymers (dimer, codimer, etc.), hydropolymers (hydrodimer, hydrocodimer, etc.) cumene, isopetane, isohexane, neohexane, isoheptane, iso-octane, motor benzol (benzene), and other blending agents derived from petroleum (excludes natural gasoline).

[4]Code 2911198 included with code 2911131 for 1967.

[5]Detailed product statistics for liquefied gases used as chemical raw material are published by the U. S. Tariff Commission in the report "Synthetic Organic Chemicals, United States Production and Sales."

[6]Although respondents were requested to report receipts in the same manner as billed by the shipper, the figures indicate that items billed as other oils by the shipper were sometimes reported as receipts of "unfinished oils" or "lubricating oil base stock" for the refinery receiving these oils.

[7]Includes such products as cracking stock, unfinished gasoline, requiring further distillation, naphtha stocks, soaps, wax distillate, and other unfinished petroleum oils. Excludes lubricating oil base stocks, natural gasoline and cycle condensates.

[8]Includes light, medium, neutral, heavy neutral, and residual stocks.

[9]Includes flux for paving, roofing, waterproofing, mastic, and other purposes; cut-back asphalt, emulsified asphalt and fluxes made in petroleum refineries, and other liquid asphaltic products except road oil and fuel oil used for heating purposes.

[10]Includes asphalt for paving, roofing, waterproofing, briquetting, mastic, pipe coating, molding composition, and other heavy asphalt products.

[11]Product codes 2911000 and 2911002 included in figures for code 29110.

[12]Represents residual asphaltic oil used for surface treatment of road and highways.

[13]Includes petroleum ether, rubber solvent, mineral spirits (petroleum spirits), varnish makers' and painters' naphtha, high-solvency naphtha, benzol diluent, lacquer diluent, cleaners' naphtha, stoddard solvent, extraction solvents, and other petroleum distillates shipped as solvents.

[14]Represents amorphous paraffin of melting point not under 145°.

[15]Includes oils for lubricating purposes and such nonlubrication purposes as transformer oil, hydraulic oil, processing oil, quenching oil, and liquid rust preventative.

[16]Includes greases for aviation, automotive, industrial, and railroad uses; launching grease, and cutting, drawing, and grinding compounds and paste. Also includes paste rust-preventative compounds and thread compounds.

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TABLE 4 Materials Consumed, by Kind: 1972 and 1967

(See appendix, Explanation of Terms)

1972 code	Material	Unit of measure	1972		1967	
			Quantity	Delivered cost (million dollars)	Quantity	Delivered cost (million dollars)
	INDUSTRY 2911.--PETROLEUM REFINING					
	Materials, containers, and supplies, total	.....	(X)	19,646.3	(X)	14,535.3
	Crude petroleum, including field condensate	Million bbl...	4,260.2	15,523.8	3,621.2	11,246.8
131111	Domestic	...do.....	3,398.1	12,372.9	3,202.9	9,981.8
131112	Foreign	...do.....	862.1	3,150.9	418.3	1,265.0
291181	Foreign unfinished oils (received from foreign countries for further processing)	...do.....	52.8	210.0	30.8	109.4
132121	Plant condensate	...do.....	45.7	151.2	30.1	94.2
132122	Natural gasoline, mixed and crude, including drip gasoline	...do.....	99.1	336.8	88.2	281.6
132123	Liquefied petroleum gases, including feedstocks[1]	..do.....	226.3	632.1	176.9	462.0
291107	Benzol (benzene) (100% C_6H_6)	...do.....	4.2	29.0	1.6	14.3
	Additives, except animal and vegetable oil:					
280011	Antioxidants, antiknock compounds, and inhibitors	1,000 bbl.....	(S)	467.6	2,624	412.5
280012	Other additives, including soaps and detergents	...do.....	307.7	134.1	2,132	102.5
207001	Animal and vegetable oils	...do.....	11.4	5.6	121	5.4
281980	Chemical catalytic preparations	.....	(X)	120.2	(X)	98.1
281238	Sodium hydroxide (100% NaOH) (caustic soda)	1,000 s. tons.	330.6	22.0	277.8	14.3
281931	Sulfuric acid (100% H_2SO_4) (except spent)	...do.....	1,961.6	44.0	1,952.2	40.0
	Containers:					
340001	Metal	.....	(X)	72.6	(X)	62.1
260091	Paper and paperboard containers and shipping sacks, including corrugated boxes	.....	(X)	14.4	(X)	13.1
265522	Cans, bodies with combinations of fiber and other materials (foil, plastic, etc.) with metal ends	.....	(X)	30.0	(X)	37.4
970089	Cost of materials received from petroleum refineries and lube manufacturers (represents cost of materials for which quantities are shown in the "Receipts" column of table 3A)	.....	(X)	898.5	(X)	985.7
970099	All other materials, components, parts, containers, and supplies consumed	.....	(X)	730.9	(X)	469.5
973000	Materials, containers, and supplies, n.s.k.	.....	(X)	180.5	(X)	295.4

1972 code	Material	1972[2]		
		Unit of measure	Quantity	Delivered cost (million dollars)
	INDUSTRY 2992.--LUBRICATING OILS AND GREASES			
	Materials, containers, and supplies, total	.....	(X)	356.7
	Crude petroleum, including field condensate	Million bbl.....	(D)	(D)
131111	Domestic	...do.....	-	-
131112	Foreign	...do.....	-	-
291181	Foreign unfinished oils (received from foreign countries for further processing)	...do.....	-	-
132121	Plant condensate	...do.....	-	-
132122	Natural gasoline, mixed and crude, including drip gasoline	...do.....	-	-
132123	Liquefied petroleum gases, including feedstocks	...do.....	-	-
291107	Benzol (benzene) (100% C_6H_6)	...do.....	-	-
	Additives, except animal and vegetable oil:			
280011	Antioxidants, antiknock compounds, and inhibitors	1,000 bbl.....	25.1	15.4
280012	Other additives, including soaps and detergents	...do.....	50.3	38.2
207001	Animal and vegetable oils	...do.....	17.9	9.5
281980	Chemical catalytic preparations	.....	-	-
281238	Sodium hydroxide (100% NaOH) (caustic soda)	1,000 s. tons.....	(S)	.3
281931	Sulfuric acid (100% H_2SO_4) (except spent)	...do.....	10.9	.3
	Containers:			
340001	Metal	.....	(X)	32.6
260091	Paper and paperboard containers and shipping sacks, including corrugated boxes	.....	(X)	4.8
265522	Cans, bodies with combinations of fiber and other materials (foil, plastic, etc.) with metal ends	.....	(X)	18.2
970089	Cost of materials received from petroleum refineries and lube manufacturers (represents cost of materials for which quantities are shown in the "Receipts" column of table 3A)	.....	(X)	123.1
970099	All other materials, components, parts, containers, and supplies consumed	.....	(X)	49.5
973000	Materials, containers, and supplies, n.s.k.[3]	.....	(X)	64.8

- Represents zero. (X) Not applicable. (NA) Not available. (S) Withheld because the estimates did not meet publication standards.

[1] Represents liquified petroleum gases from natural gasoline plants only.

[2] This item represents the total cost of materials for establishments that did not report detailed materials data. This includes estimates for companies that were not mailed report forms.

[3] Comparable data for 1967 are not available due to revisions in the Standard Industrial Classification.

A 5004

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Appendix A. SCOPE AND COVERAGE

This report is one of a series presenting preliminary information on industries and products from the 1972 Census of Manufactures. The data will be superseded in a final report which in turn will be included in *Volume II, Industry Statistics, 1972 Census of Manufactures.* The final report will include a comprehensive discussion of the concepts and definitions used in the census.

The census of manufactures covers each manufacturing establishment in the United States with one paid employee or more; manufacturing establishments with no employees are excluded from this census. Firms which operate more than one establishment were required to file a separate report for each location. Companies which engaged in distinctly different lines of activity at one location were asked to submit separate reports if the company records permitted such a separation and the activities were of significant size.

This report does not include figures for administrative offices, warehouses, garages, or other auxiliary units which service manufacturing establishments of the same company.

In the 1972 census, as in the 1967 census, approximately 120,000 manufacturing firms with less than 10 employees were excused from filing reports. Under special arrangements which safeguarded the confidentiality of both tax and census records, limited data (payrolls, sales, and industry classification) from the administrative records of the Social Security Administration (SSA) and the Internal Revenue Service (IRS) were made available to the Census Bureau for use in the 1972 Economic Censuses (Retail and Wholesale Trade, Service Industries, Construction Industries, Manufactures, and Mineral Industries). Estimates for data other than payrolls and sales for these small establishments were developed from industry averages. The effect on industry aggregates is slight in most industries. For manufacturing as a whole, they account for less than 3 percent of the payrolls and value added. In industry 2911, these small establishments accounted for approximately 0 percent of payrolls and 0 percent of value added by manufacture, while in industry 2992, these small establishments accounted for approximately 4 percent of payrolls and 4 percent of value added by manufacture. Detailed product and materials data for these small establishments were not estimated. The entire estimated value of shipments and cost of materials were imputed to "not specified by kind" categories.

As in earlier censuses, a number of small establishments may have been misclassified as to industry. However, such possible misclassifications have no significant effect on the statistics other than the number of establishments. As indicated above, report forms were not mailed to very small establishments (less than 10 employees). The industry classifications for these establishments were assigned on the basis of brief descriptions of the general activity of the establishment.

Where the description is incomplete or there are relatively fine lines of demarcation among industries or between manufacturing and nonmanufacturing activity, the code assigned to an establishment could differ from that which would have been assigned on the basis of more complete product or activity information. Therefore, the total establishment count should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the total number of establishments.

The general statistics (employment, payrolls, cost of materials, value added by manufacture, value of shipments) appearing in tables 1, 2 and 4 are reported for each establishment as a whole. Thus, these data reflect not only the primary activities of the establishments, which determine their industry classification, but also all secondary activities as well. This fact should be taken into consideration when comparing the data in tables 1, 2, and 4 with the value of products appearing in table 3. The data in table 3 provide information on the value of the primary products of the industry shipped by all manufacturing establishments whether they are classified in the industry or in other industries and producing the products as secondary products.

More detailed figures for this industry will appear in the final census reports. Final reports will also include a comprehensive discussion of such concepts as "industry," "establishments," and "secondary production," as well as the various statistical items such as "employment," and "value added." Similar preliminary and final reports will be issued for other industries during the coming months. A series of preliminary summary reports showing U.S. totals for each manufacturing industry and for each State are being issued. Final industry reports and final area reports will be published during 1974.

Order forms showing these reports and their prices may be obtained from any U.S. Department of Commerce district office or from the Publications Distribution Section, Social and Economic Statistics Administration, Washington, D.C., 20233.

The 1972 Census of Manufactures is the 29th census of manufacturing establishments in the United States. For 1972, it was conducted jointly with the censuses of mineral industries, construction industries, retail trade, wholesale trade, and selected services under authority of Title 13 of the United States Code. Title 13 specifies that a census of manufactures be conducted every 5 years, to cover years ending in "2" and "7". Title 13 also authorizes an annual sample survey of manufacturing establishments in interim years.

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Appendix B. EXPLANATION OF TERMS

(For a more complete discussion of these terms and the method of compiling the Census of Manufactures, see the "Introduction" to the 1967 Census of Manufactures, Volume II).

All Employees--All full time and part-time employees on the payrolls of operating manufacturing establishments for any part of the pay period ended nearest the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employee" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average of those for midmonth payroll periods of March, May, August, and November.

Payroll—This item includes all forms of compensation such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of these establishments if a corporation, it excludes payments to the proprietor or partners, if an unincorporated concern. Respondents were told that in reporting they could follow the definition of payrolls used for calculating the Federal withholding tax.

Production and Related Worker Man-Hours—This total relates to production worker man-hours worked or paid for at the plant including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave when the employee was not at the plant.

Cost of Materials—The term "cost of materials" refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed regardless of whether these items were purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (a) all raw material, semifinished goods, parts, components, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year; (b) electric energy purchased; (c) fuels consumed for heat, power, or the generation of electricity; (d) work done by others on materials or parts furnished by manufacturing establishments (contract work); and (e) products bought and resold in the same condition.

Specific Materials Consumed—In addition to the total cost of materials which every establishment was required to report, information was also collected for many manufacturing industries on the consumption of major materials used in manufacturing. These materials inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Information regarding the specific materials consumed is shown in table 4, if appropriate to this industry. Establishments consuming less than a specified amount (usually $5,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which administrative records used were imputed as "not specified by kind." (See "Scope and Coverage" for importance of administrative records in the industry.)

Value of Shipments—The amounts under value of shipments are the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts such as receipts for contract work performed for others, installation and repair, sales of scrap, and sale of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value; i.e., including not only the direct costs of production but also a reasonable proportion of "all other costs" (including company overhead) and profit.

Shipment of Individual Products—In the 1972 census program, more detailed shipment information was collected on the output of approximately 10,000 individual products. These products are identified by a 7-digit code and are grouped into approximately 1,200 classes of products which in turn are primary to about 450 4-digit industries. Data at the 5-digit product-class

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level have been collected each year as part of the Annual Survey of Manufactures. Information at the 7 digit level is collected in the quinquennial Census of Manufactures program and, for many industries, in the Current Industrial Reports program of the Bureau.

Typically, both quantity and value of shipments information were collected. However, if there was no meaningful physical quantity measure that could be reported by manufacturers, only value of shipments was collected. Insofar as other measures were collected for selected products, they are shown in table 3.

Value Added by Manufacture—This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments for products manufactured plus receipts for services rendered. The result of this calculation is then adjusted by the net change in finished goods and work-in-process inventories between the beginning and end of the year.

"Value added" avoids the duplication in the value of shipments figure which results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

Expenditures for Plant and Equipment—For establishments in operation and establishments under construction but not yet in operation, manufacturers were asked to report their expenditures for (a) permanent additions and major alterations to manufacturing establishments, and (b) new machinery and equipment used for replacement purposes and additions to plant capacity if they are of the type for which depreciation accounts are ordinarily maintained.

These totals exclude that portion of expenditures for new facilities and equipment leased from nonmanufacturing concerns, new facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations. Expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses are also omitted from the figures for new capital expenditures.

End-of-Year Inventories—Respondents were asked to report their inventories at approximate current costs if feasible; otherwise, at book values. Since different methods of inventory valuation are used (LIFO, FIFO, etc.), the definition of the value of the inventories aggregated for all establishments in an industry is not precise. The figures on change in inventory between years are of considerably greater significance than the measurement of the level of inventories.

Gross Value of Fixed Assets—This statistic is included with the basic general statistics for the first time in the 1972 Census of Manufactures. The information, however, is collected in the annual survey of manufactures sample and is thus subject to sampling error. The sampling errors will be included in the special census report on Gross Book Value of Depreciable Assets and Rental Payments. Approximate sample errors for 1972 can also be obtained from the 1971 Annual Survey of Manufactures. The data cover all fixed assets on the books of establishments at the end of the year for which depreciation accounts are maintained. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all buildings, structures, and machinery and equipment. Excluded are nondepreciable assets; for example, inventories and intangible assets such as patent rights and royalties. Also excluded are land and depletable assets such as timber and mineral rights.

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THE 1972 ECONOMIC CENSUSES

Early in 1972...we asked the business community's help in providing us with the basic information about its business activities during the year 1972. The facts were requested so that we, in turn, could provide YOU with the data from various economic areas! NOW - the results are in! They're being analyzed...fed to computers...and published for YOUR use....YOUR needs...YOUR advantage in keeping up with the latest trends in the business and industrial worlds.

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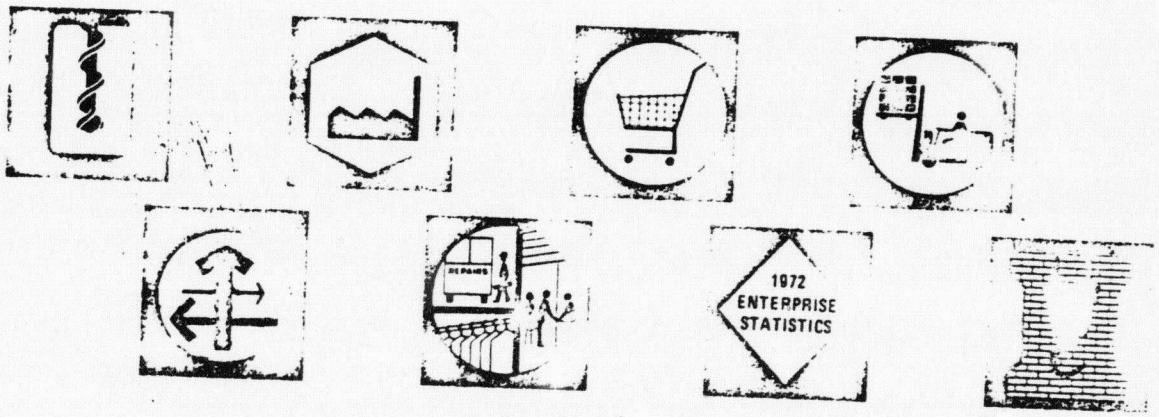

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CX 344 K

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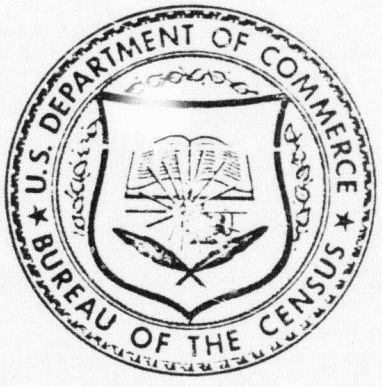
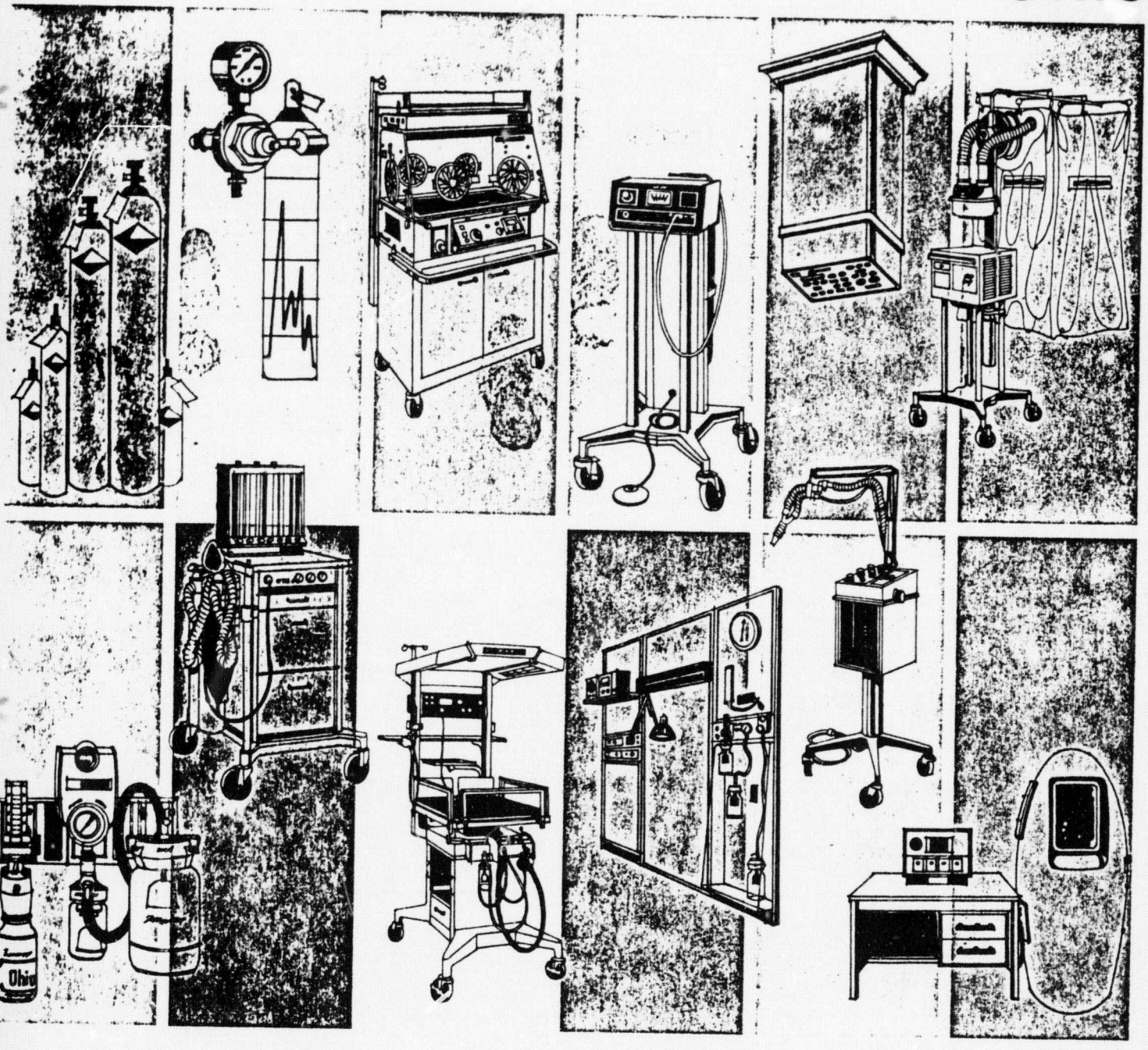


CX Physical Exhibit A

A 5009

Ohio™



AIRCO®

Ohio Medical Products

A 5010

C-2

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DM5000

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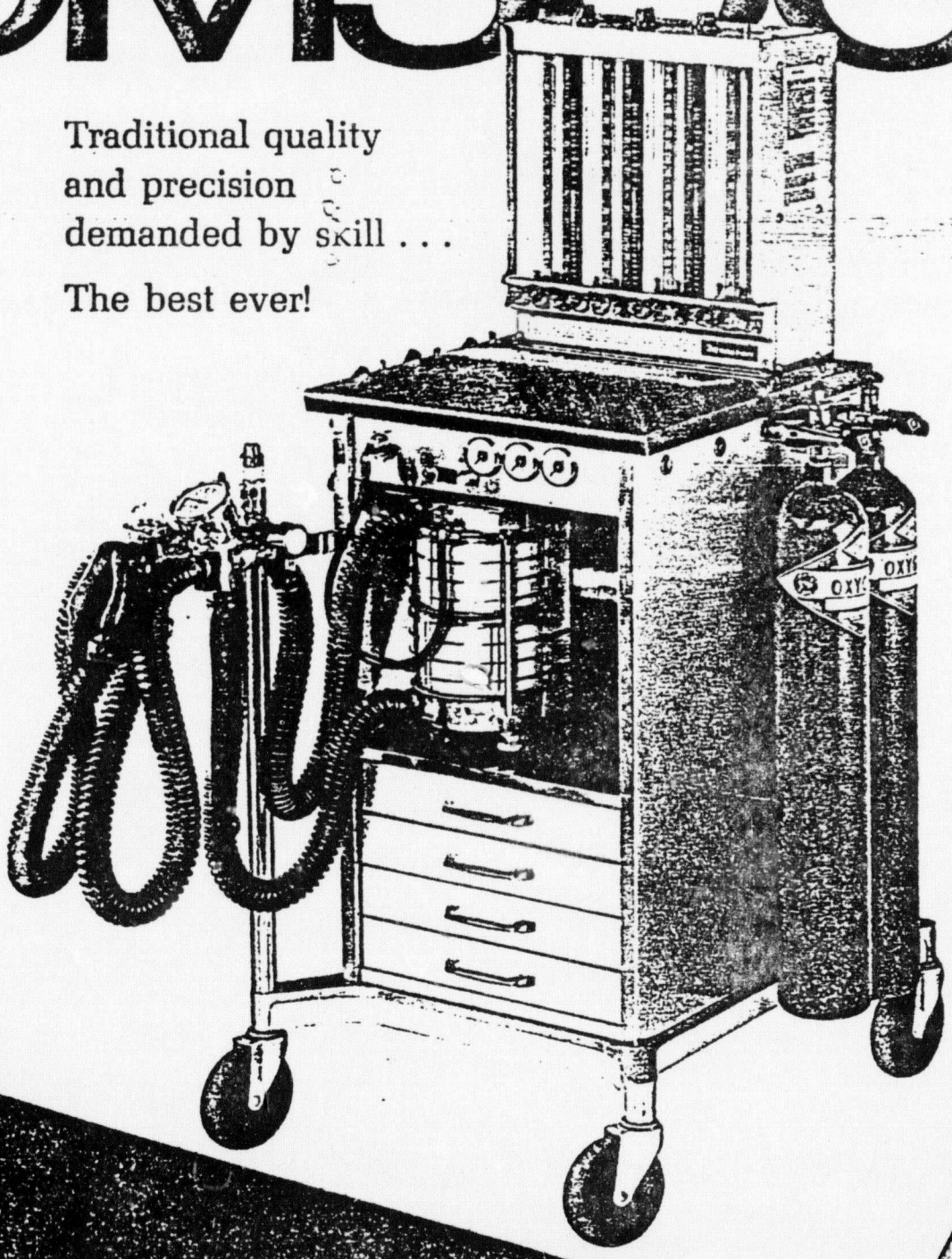

Ohio Medical Products

AIRCO

A 5011

	MODEL	DESCRIPTION	VAPORIZERS*	STOCK NUMBER
3 GAS MODEL	B5333	O_2, N_2O, C_3H_6	E, F, P	216-5333-800
			E, F	216-5333-801
			E, P	216-5333-802
			F, P	216-5333-803
			E	216-5333-804
			F	216-5333-805
			P	216-5333-806
4 GAS MODEL	B5433	O_2, N_2O, C_3H_6, CO_2	E, F, P	216-5433-800
			E, F	216-5433-801
			E, P	216-5433-802
			F, P	216-5433-803
			E	216-5433-804
			F	216-5433-805
			P	216-5433-806
	B5434	O_2, N_2O, C_3H_6, He	E, F, P	216-5434-800
			E, F	216-5434-801
			E, P	216-5434-802
			F, P	216-5434-803
			E	216-5434-804
			F	216-5434-805
			P	216-5434-806
5 GAS MODEL	B5533	O_2, N_2O, C_3H_6, C_2H_4, CO_2	E, F, P	216-5533-800
			E, F	216-5533-801
			E, P	216-5533-802
			F, P	216-5533-803
			E	216-5533-804
			F	216-5533-805
			P	216-5533-806
	B5534	O_2, N_2O, C_3H_6, C_2H_4, He	E, F, P	216-5534-800
			E, F	216-5534-801
			E, P	216-5534-802
			F, P	216-5534-803
			E	216-5534-804
			F	216-5534-805
			P	216-5534-806

***KEY: "E" — Ether, "F" — Fluothane, "P" — Penthrane**

OPTIONAL EQUIPMENT

DESCRIPTION	STOCK NO.
Flip Top Writing Drawer	214-1123-700
Drawer Kit, Small (2¼")	216-6705-880
Drawer Kit, Medium (4½")	216-6705-881
Drawer Kit, Large (9")	216-6705-882
Drawer Lock Kit (3 and 4 gas models only)	216-6707-870
Nitrous Oxide Flush Valve	216-6473-880

Please refer to Price List #40 for latest pricing data.

Other Accessories

Items such as the absorber, rubber goods, etc., must be ordered separately at additional cost. Please refer to the Anesthesia Catalog, No. 40, for complete product information.

Please specify style of pipeline inlet connections when ordering. This is an N.F.P.A. requirement meant to minimize the possibility of cross-connection. For ordering details, refer to page 17 in the Anesthesia Machine Accessories Catalog, Form No. 1754.

Electrical Characteristics: 115 volt, 60 cycle A.C. Please clarify other voltage requirements on export orders.

Ohio Medical Products

P.O. Box 1319, Madison, Wis. 53701

EASTERN REGION
Suite No. 4, 95 Cedar Lane
Englewood, New Jersey 07631

MIDWESTERN REGION
188 West Randolph Street
Chicago, Illinois 60601

PACIFIC REGION
1231 Second Street
Berkeley, California 94710

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Ohio Medical Products Canada
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A 5012

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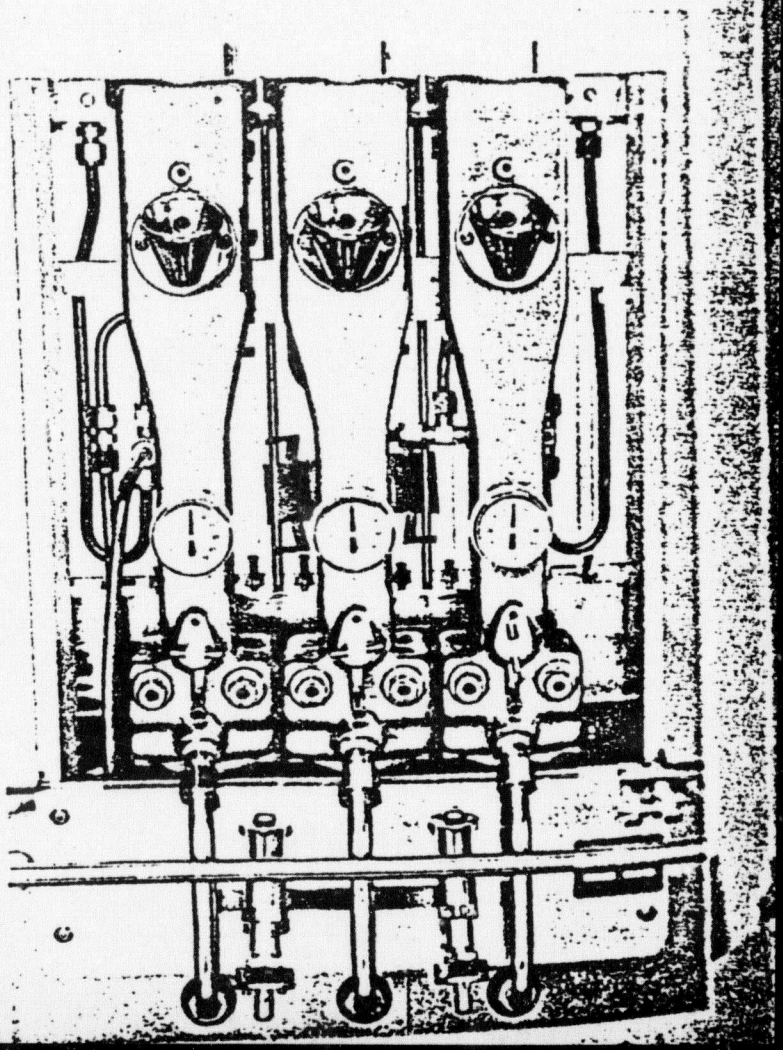
DM5000

What you don't see is the most dramatic advance in anesthesia machines since 1910

ELECTRICALLY HEATED VAPORIZERS

Safe, explosion-proof, UL and CSA listed electrically heated vaporizers are thermostatically controlled to keep vaporizer contents at a constant 75±1°F. This precise control guarantees predictable rates of vapor delivery — directly metered by the agent flowmeters — and eliminates the tedious calculations formerly required. Concentration of agent is determined by dividing the flow through the vaporizer by total flow or by multiplying the desired percentage by total flow to obtain the setting for the vaporizer flowmeter or by adjusting the flow to the uptake of the patient.



A 5013

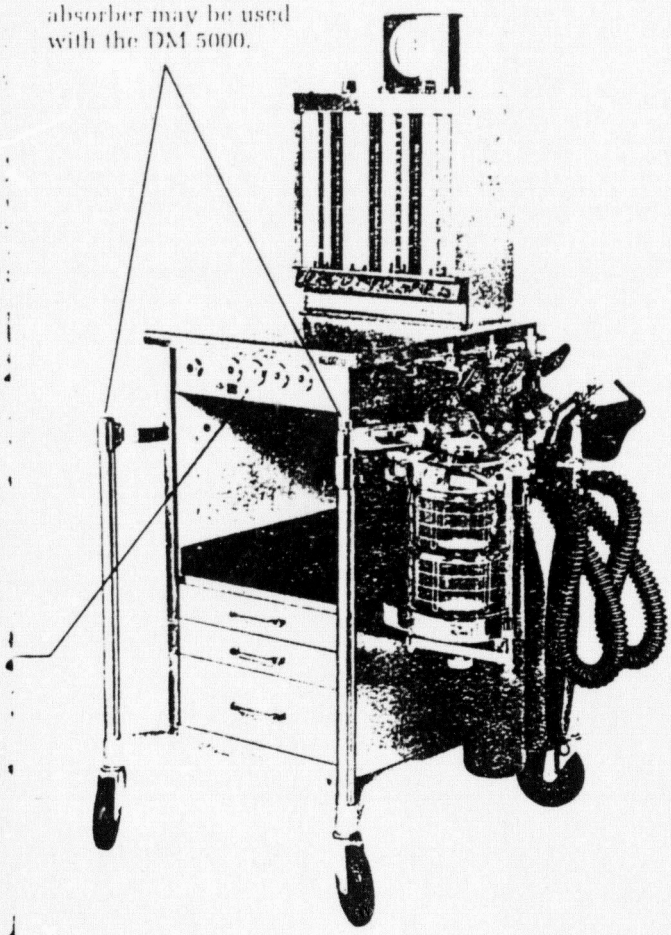
Right and/or Left Mounted Absorber

For convenience the safe, telescoping absorber post may be right and or left-hand mounted. It can be changed anywhere, anytime. Any of the five new Heid-a-sorb* absorber models or the Ohio Model 19 and 21 absorber may be used with the DM 5000.

Blood Pressure Manometer

A Tycos* aneroid blood pressure manometer may be ordered as an accessory. Ohio's Side-Kick Blood Pressure inflator is available for semiautomatic blood pressure measurements.

*TM Taylor Instrument Co.



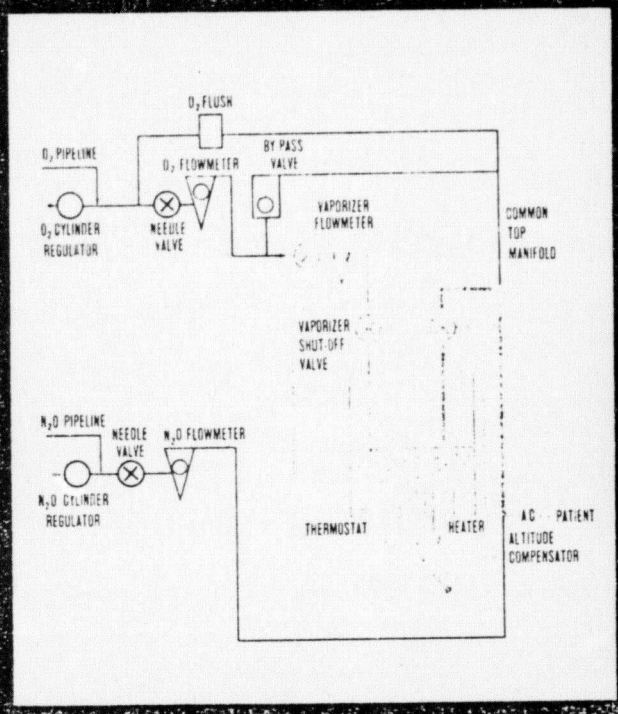
42 Drawer Choices

Three basic drawer units are available as optional equipment and must be ordered separately at additional cost. The DM 5000 cabinet contains nine spaces which may be used for drawers. A 9" drawer takes four spaces; the 4½" drawer takes two spaces; the 2¼" drawer takes one space. Within certain restrictions you may choose any combination you wish to fill all or part of the nine spaces.

Bigger Wheels Full Conductivity

Five inch conductive rubber casters help move the machine easily over door and elevator sills. The casters contain one set of ball bearings for easy rolling. A static drag chain is standard safety equipment. All accessories, including rubber goods, are completely conductive for full safety.

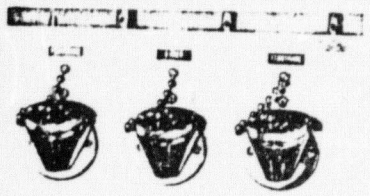
How Direct Metering Vaporization Works



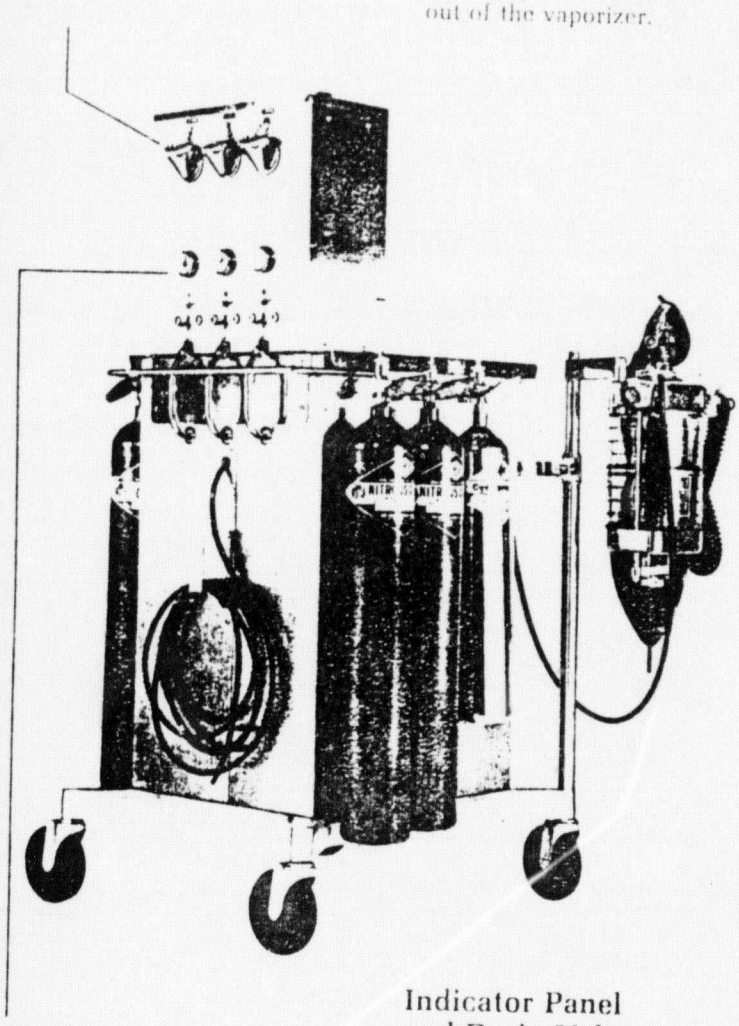
Direct metering vaporization, an Ohio first, means that vaporizer flowmeters are calibrated directly in flow of volatile agent. This means controlled, predictable output of saturated vapor.

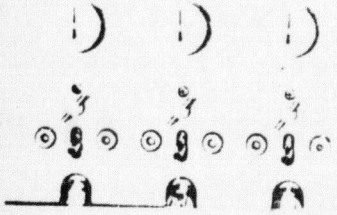
- The schematic view above illustrates the vaporizer system and gas flow circuitry incorporated in this anesthesia machine. The following is a description of Direct Metering Vaporization.
- Oxygen is delivered from a cylinder supply to an oxygen regulator. Immediately after the regulator, the oxygen flush line is split off to the flush valve which connects directly to the outlet of the machine and to a needle valve and flow meter which control total oxygen flow. (Pipeline oxygen enters the apparatus after the regulator.)
- After the oxygen leaves the oxygen flowmeter, if a vaporizer is switched "on," the stream is split by a by-pass valve and all or a portion of the oxygen will be diverted through the vaporizer needle valve and flowmeter into the vaporizer. Because the output of the vaporizer is always saturated with agent vapor, the oxygen that has been diverted through it will carry a known concentration of vapor from the vaporization chamber.
- The vapor saturated oxygen from the vaporizer combines with other gases and the balance of the metabolic oxygen and is delivered to the outlet of the machine.
- The vaporizer flowmeter is calibrated directly in cc/minute of vapor flow. The vaporizer thermostat is in intimate contact with the liquid and senses any temperature change. This controls the on-off action of the heater, which is in a well in the bottom of the vaporizer chamber, maintaining minimum vaporizer temperature of 75° F.
- To complete the flow diagram, we have illustrated a two gas machine. The flow of nitrous oxide is shown on the bottom line.
- The machine is set at time of delivery for ambient barometric pressure. A spring-loaded valve (labeled AC for altitude compensator) maintains a pressure behind the outlet of 800 mm of mercury absolute. The ambient atmospheric pressure at sea level averages 760 mm of mercury absolute. There is normally a minimum of 40 mm of mercury pressure differential between the pressure in the machine and the outlet. Thus, the user is assured of flowmeter accuracy, without variations due to gas density, and the machine can withstand intermittent positive pressure in the breathing circuit of at least 40 mm of mercury without any change in flowmeter readings (bobbing floats) or "milking" of the vaporizer chambers.

Provision Against Overfilling



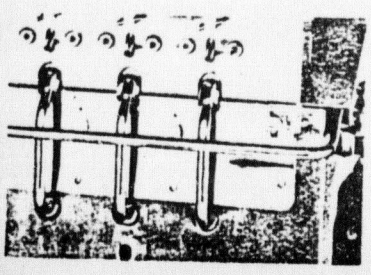
Vaporizer funnels are designed so that overfilling is impossible, thus prevent... carry-over of liquid agent into the patient circuit by normal rates of gas flow. Captive funnel caps keep dust and dirt out of the vaporizer.





Indicator Panel and Drain Valves

Thermometers indicate the temperature in each vaporizer. One of the lights for each vaporizer indicates that power is available. The other indicates that the heater is operating. Drain valves are provided for each vaporizer.

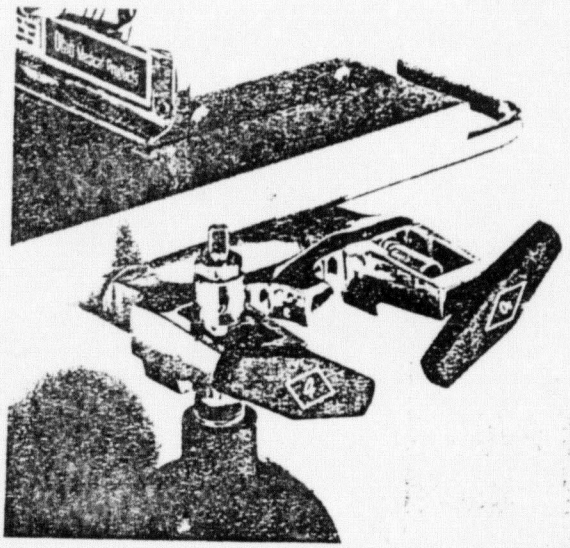


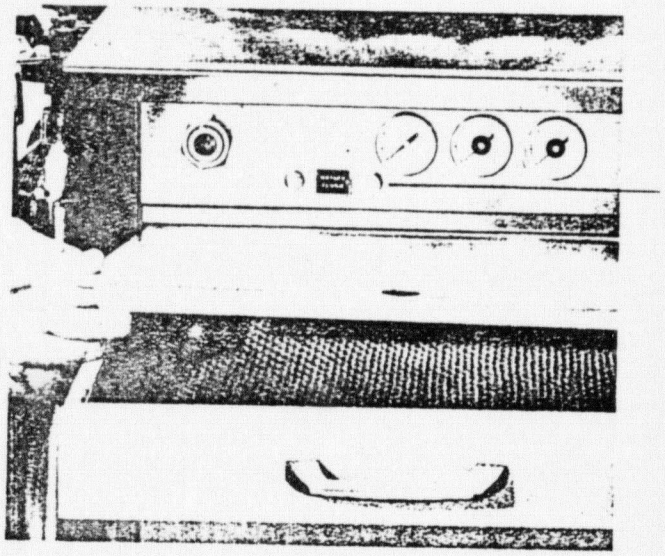
Push Bar

Vaporizers and electrical connections are protected by this bar which is also used for convenience in moving the machine.

Strong Yoke Assembly

Strength comes from one-piece forged brass construction which Ohio is the first to use. Resilient handles are color and symbol coded for safety. Cylinder stabilizers eliminate noise and minimize gas leakage due to cylinder swing.





Flush Valves

An easy to use, spring-loaded, pushbutton provides an immediate oxygen or nitrous oxide flush flow of 60 l.p.m. It is not necessary to change the flowmeter setting or shut off vaporizers to use the flush valve.

Flip-Top Drawer Accessory

A stainless steel, flip-top, hinged cover may be ordered as an accessory for any drawer. This cover provides an extra writing surface or temporary shelf and contains a finger hole for easy lifting.

Large Flat Surfaces For Easy Cleaning

The DM 5000 is designed with several large, flat surface areas and a minimum of cracks, crevices, and hard-to-get-at places for easy cleaning. Rear side of flowmeters is also an easily cleaned surface. Expansive, flat cabinet top surface aids charting.

Long Scale (11") Hand Calibrated Flowmeters

The hand calibrated, color coded flowmeters are protected against breakage by a Homalite* static-dissipating shield. The circuit design maintains a constant pressure on the flowmeters. Intermittent positive pressure does not make the flowmeters bob up and down.

Color And Symbol Coded Flow Control Valves

A separate flow control valve is provided directly under its associated flowmeter. The large knob controlling each valve is identified by color code and gas symbol or the name of the volatile agent. Finger space is adequate for easy adjustment. A positive stop on the knob prevents damage to the valve seat by excessive closing effort.

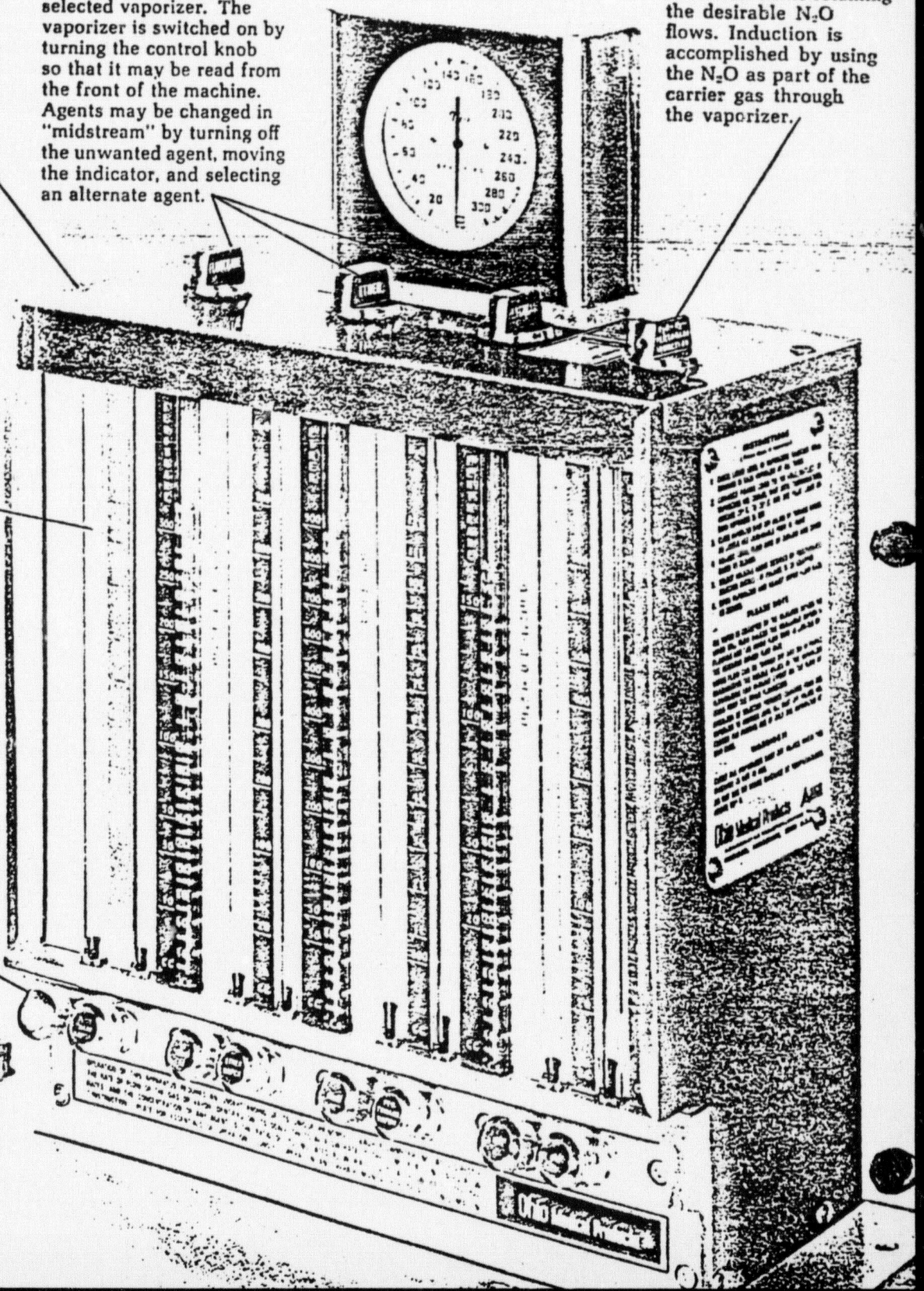
* TM Homalite Corporation

Agent-In-Use Indicators And Safety Lockout

The sliding indicator on the right operates an interlock which prevents accidental use of more than the selected vaporizer. The vaporizer is switched on by turning the control knob so that it may be read from the front of the machine. Agents may be changed in "midstream" by turning off the unwanted agent, moving the indicator, and selecting an alternate agent.

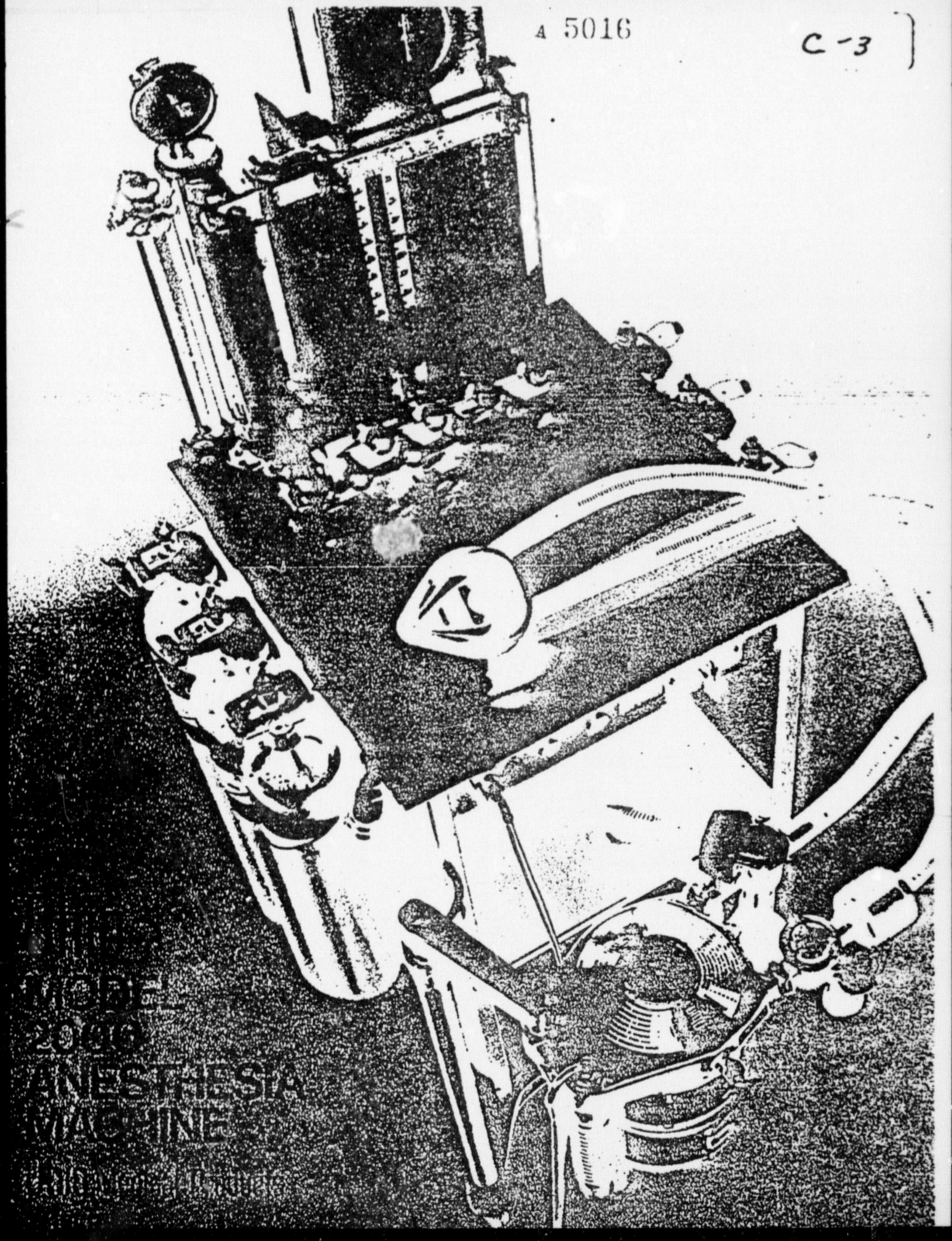
$N_2O - O_2$ Penthrane Induction

This valve allows the high concentration of Penthrane for induction while retaining the desirable N_2O flows. Induction is accomplished by using the N_2O as part of the carrier gas through the vaporizer.



A 5016

C-3



STANDARD

A 5017

FLOWMETERS

■ The long-scale, hand-calibrated flowmeters are standard on the Series 2000. Two separate flowmeters, one for high and one for low flows, are provided for oxygen, nitrous oxide and oxygen thru the **Verni-trol** Vaporizer, with one flowmeter for each additional gas. Large visible floats are easily and accurately read against a white background beside color coded scales.

Standard calibrations include:
Oxygen: 20cc to 700cc and 400cc to 6 l.p.m.
Nitrous Oxide: 20cc to 700cc and 500cc to 12 l.p.m.
Oxygen thru Verni-trol: 20cc to 250cc and 200cc to 1200cc.
Cyclopropane: 20cc to 750cc.
Ethylene: 300cc to 7 l.p.m.
Helium: 200cc to 10 l.p.m.
Carbon Dioxide: 20cc to 700cc.

Flowmeter calibrations other than standard are also available upon request.

■ Needle valves have silver seats, Teflon* packing and adjustable stops for positive shutoff, smooth operation and a long, reliable life. Flows are quickly changed without floats bobbing. The rugged construction reduces "down" time as well as overall costs. Control knob is color coded with the gas symbol.

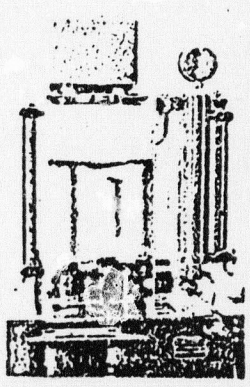
■ One-piece, pin-indexed brass yokes with chrome finish assure a long trouble-free life and ease of cleaning. "T" handles are coded with color and gas symbol. Gas cylinder stabilizers eliminate noise and gas leakage due to cylinder swing.

■ Telescoping absorber post locks in any position within a 19-inch vertical range while allowing the absorber to be positioned anywhere within an 18-inch arc.

■ The cabinet provides a 250 sq. in. stainless steel working surface, plus a durable cast aluminum base. It is equipped with four-inch conductive rubber ball-bearing casters for effortless maneuverability.

■ Unit has a complete chain of conductivity.

■ Pressure Sensor System automatically shuts off all gases for patient safety in the event the oxygen supply is interrupted.



Verni-Trol® Vaporizer is a versatile, universal-type vaporizer adaptable to most liquid anesthetic agents. It is an out-of-circuit type vaporizer wherein the carrier gas bubbles through the liquid agent.

Saturated vapor concentrations are supplied in an oxygen vehicle which in turn is accurately diluted with more oxygen or other carrier gases. The large, 600 cc, liquid capacity of the vaporizer is sufficnet for longer procedural work.

A funnel-type access cover, captive filler plug, full-length liquid level indicator and drain cock are integral parts of the **Verni-trol** Vaporizer.

OPTIONAL

The following major accessories are recommended for the Series 2000. Please refer to the "How to Order" section for stock numbers. For additional information on these and other accessories request the OHIO General Anesthesia Apparatus & Accessories Catalog No. 40.

■ **Side-Arm Vaporizer**—A second vaporizer is an important addition to the Series 2000 Anesthesia Machine and should be considered with the initial purchase. Anesthetic preferences vary and new agents continue to be developed which may require this additional capability. The Side-Arm **Verni-trol** Vaporizer is the perfect companion to the standard **Verni-trol** Vaporizer. It utilizes the same fundamental principles of design and consistently produces accurate concentrations of vapor over extended periods.

■ **Flowmeter Shield**—A static dissipating Homalite** shield protects the flow tubes against breakage and prevents dirt and dust accumulation on the flowmeters.

■ **Blood Pressure Manometers**—The Tycos Aneroid Blood Pressure Manometer fits atop or on the side of the **Verni-trol** Vaporizer on the Series 2000 Anesthesia Machine. It comes complete with an adult cuff, bulb, tubing and bladder. A mercury column type blood pressure manometer is also available.

■ **Modular Design Drawer Kits**—Three sizes of easy-glide, roller bearing steel drawers are available, (2¼", 4½", and 9",) with or without lock and writing shelf. They can be arranged in many different configurations.

■ **Model 21 Absorber**—The OHIO Model 21 Absorber is provided with twin interchangeable transparent canisters of break-resistant molded plastic which can be changed and interchanged easily. The canisters incorporate their own flow diffusers and each holds one complete Canister-Pak† or Pre-Pak† of Sodasorb†. A center compression adjustment provides a perfect seal between the canisters. The fully equipped version has inhalation and exhalation check valves as well as a rebreathing valve. A full range pressure limiting valve from 3 to 30 mm Hg is also supplied.

■ **OHIO Anesthesia Ventilator**—This unit provides precise patient ventilation automatically. A ventilator replaces "bagging" and allows the anesthesiologist to perform other necessary tasks. The OHIO Anesthesia Ventilator may be used to supplement the breathing efforts of the patient, or fully ventilate the apneic patient. The new Anesthesia Ventilator can be volume or pressure controlled for added versatility.

■ **Anesthetic Gas Evacuator/Relief Valve**—This unit is designed to evacuate exhaust gases and anesthetic agents. It controls circuit "pop-off" pressure by an adjusting knob over the range of 2 to 30 mm Hg. The complete system consists of sixteen basic components, two or more of which are needed for any particular method of gas evacuation.

■ **Disposable Anesthesia Breathing Circuits**—OHIO's new disposable breathing circuits are inexpensive enough to be used in all general anesthesia procedures. The conductive breathing circuits include a 0.5 micron bacteria rententive filter which helps prevent cross-infection. The lightweight tubing is extremely flexible and includes a built-in swivel "Y"

■ **Suction Unit**—Not Illustrated. The Anesthesia Suction Unit is supplied complete with bottle, gauge, aspirating tubing with tip and mounting adaptor. The entire unit is easily dismantled for cleaning and autoclaving.

* Trademark of E. I. Dupont de Nemours and Company
** Trademark of Homalite Corp., Wilmington, Delaware
† Trademarks of Dewey and Almy, Division of W. R. Grace & Co.

HOW TO ORDER

A 5018

			Model	Description	Flowmeters	Yokes	Stock No.	
	3 GAS MODELS	with Verni-trol	B2333	O_2, N_2O, C_3H_6	7	5	216-6210-800	
			B2334	O_2, N_2O, He	7	5	216-6210-801	
		without Verni-trol	B2333LV	O_2, N_2O, C_3H_6	5	5	216-6211-800	
			B2334LV	O_2, N_2O, He	5	5	216-6211-801	
	4 GAS MODELS	with Verni-trol	B2433	O_2, N_2O, C_3H_6, CO_2	8	6	216-6225-800	
			B2434	O_2, N_2O, C_3H_6 He	8	6	216-6225-801	
			B2436	O_2, N_2O, C_3H_6, C_2H_4	8	7	216-6225-802	
		without Verni-trol	B2433LV	O_2, N_2O, C_3H_6, CO_2	6	6	216-6226-800	
			B2434LV	O_2, N_2O, C_3H_6, He	6	6	216-6226-801	
			B2436LV	O_2, N_2O, C_3H_6, C_2H_4	6	7		
	5 GAS MODELS	with Verni-trol	B2550	O_2, N_2O, C_3H_6, C_2H_4, CO_2	9	8	216-6240-800	
			B2551	O_2, N_2O, C_3H_6, C_2H_4, He	9	8	216-6240-801	
		without Verni-trol	B2550LV	O_2, N_2O, C_3H_6, C_2H_4, CO_2.	7	8	216-6241-800	
			B2551LV	O_2, N_2O, C_3H_6, C_2H_4, He	7	8	216-6241-801	

Model 2000 Specifications—Dimensions: 30" x 30" x 54". Approximate shipping weight: 220 - 240 lbs. Regulators (O_2, N_2O, C_2H_4, CO_2, He) 37 p.s.i.g.

Pipeline Inlet Connection—Pipeline inlets must be installed before your unit is shipped, therefore, please specify preferred inlet style when ordering to avoid delay. Although required, inlets are billed as an accessory. If not specified, standard D.I.S.S. inlets are provided.

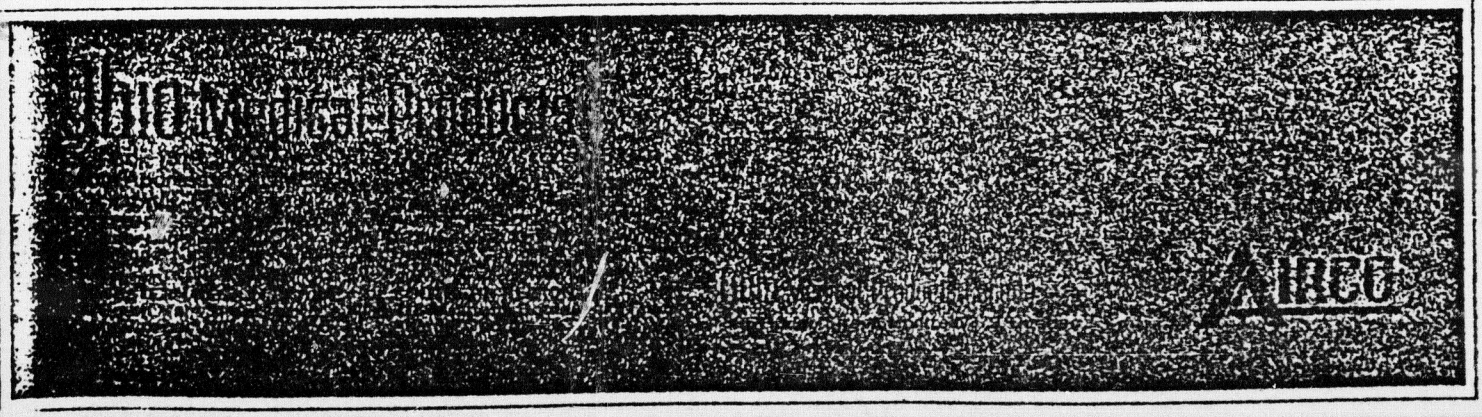
Suggested Major Options

Model 21 Absorber..... Stock No. 309-0166-883
Fully equipped with inhalation and exhalation check valves, No. 100 inhaler valve, a rebreathing valve, No. 8 ether vaporizer and conductive rubber goods. (Consult **OHIO** Anesthesia Accessories Catalog No. 1754 for information on other absorbers including the Heid-a-Sorb with remote canister.)
Side-Arm Vaporizer..... See Form No. 1754
Anesthesia Gas Evacuator/Relief Valve.... Stock No. 207-8172-800
(Refer to Form No. 547 for additional components needed for gas evacuation)
Aneroid B. P. Manometer (Tycos)..... Stock No. 216-6545-870
Mercury Column B. P. Manometer
Left hand mounting..... Stock No. 216-6448-870
Right hand mounting..... Stock No. 216-6448-871
Anesthesia Suction Unit..... Stock No. 216-6372-802
OHIO Anesthesia Ventilator..... Stock No. 309-0612-800
Floor Stand (four wheel base)..... Stock No. 311-0007-870
Hinge Arm Mounting Kit
(for 1" Absorber post)..... Stock No. 216-6402-883

Connection	O_2	N_2O
Diamond™	216-6326-870	216-6326-871
D.I.S.S.	216-6325-870	216-6327-870
Schrader	216-6325-871	216-6325-873
N.C.G.	216-6439-870	216-6439-871
Puritan	216-6370-880	216-6370-881

Disposable Conductive Anesthesia
Breathing Circuits..... See Form No. 1852
Flowmeter Shield..... See Form No. 1754
Drawer Kits
Flip Top Writing Drawer (fits any drawer). Stock No. 214-1123-700
Drawer Kit, Small (2¼")..... Stock No. 216-6705-880
Drawer Kit, Medium (4½")..... Stock No. 216-6705-881
Drawer Kit, Large (9")..... Stock No. 216-6705-882
Drawer Kit Lock Kit (secures all drawers). Stock No. 216-6707-870
Drawer Top..... Stock No. 216-6710-880
(Must be ordered when less than full complement of drawers is desired)
Top Shim..... Stock No. 214-1131-500
(Must be ordered when full complement of drawers is ordered)

Prices: Please refer to the General Price List for latest pricing data.



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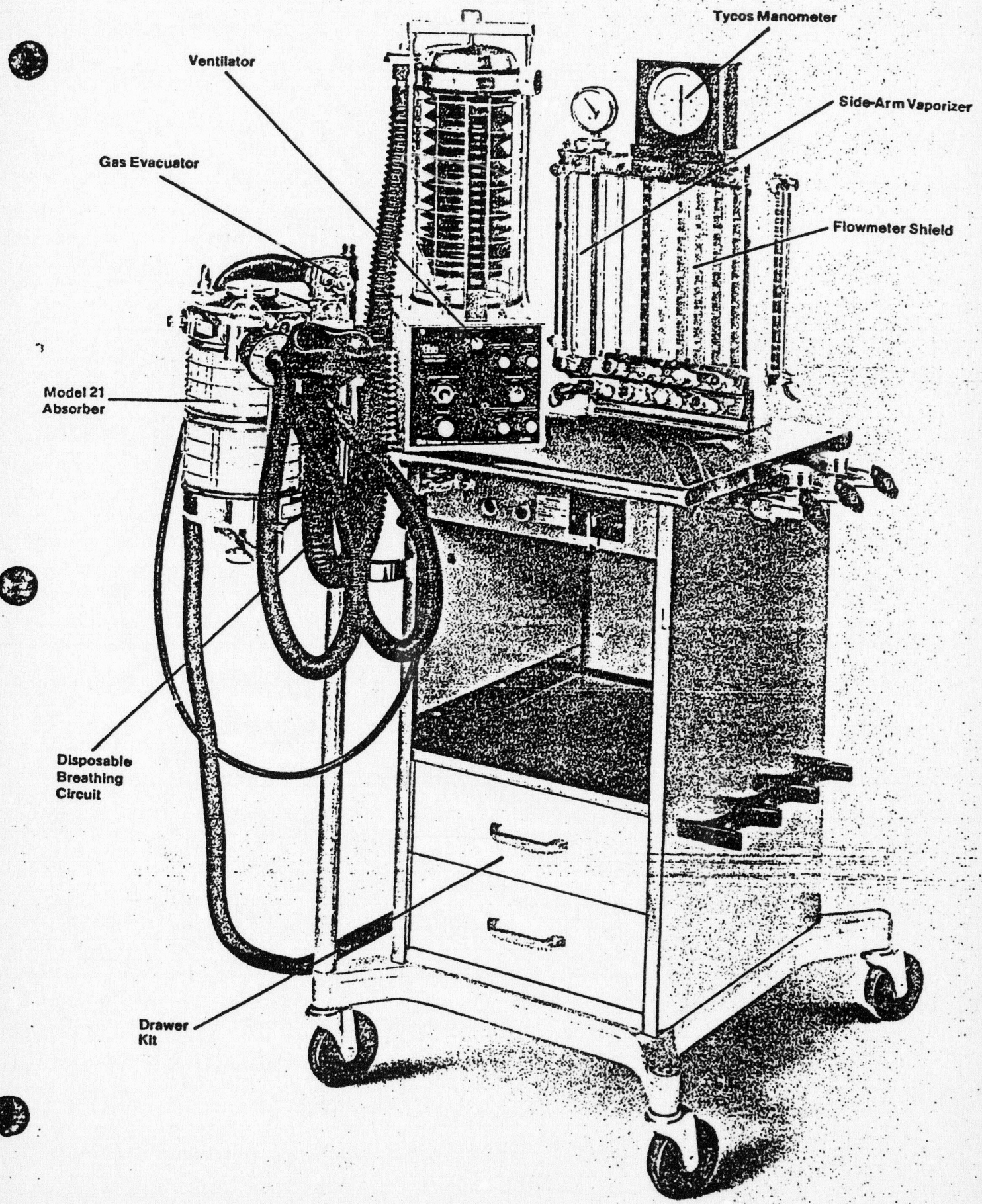
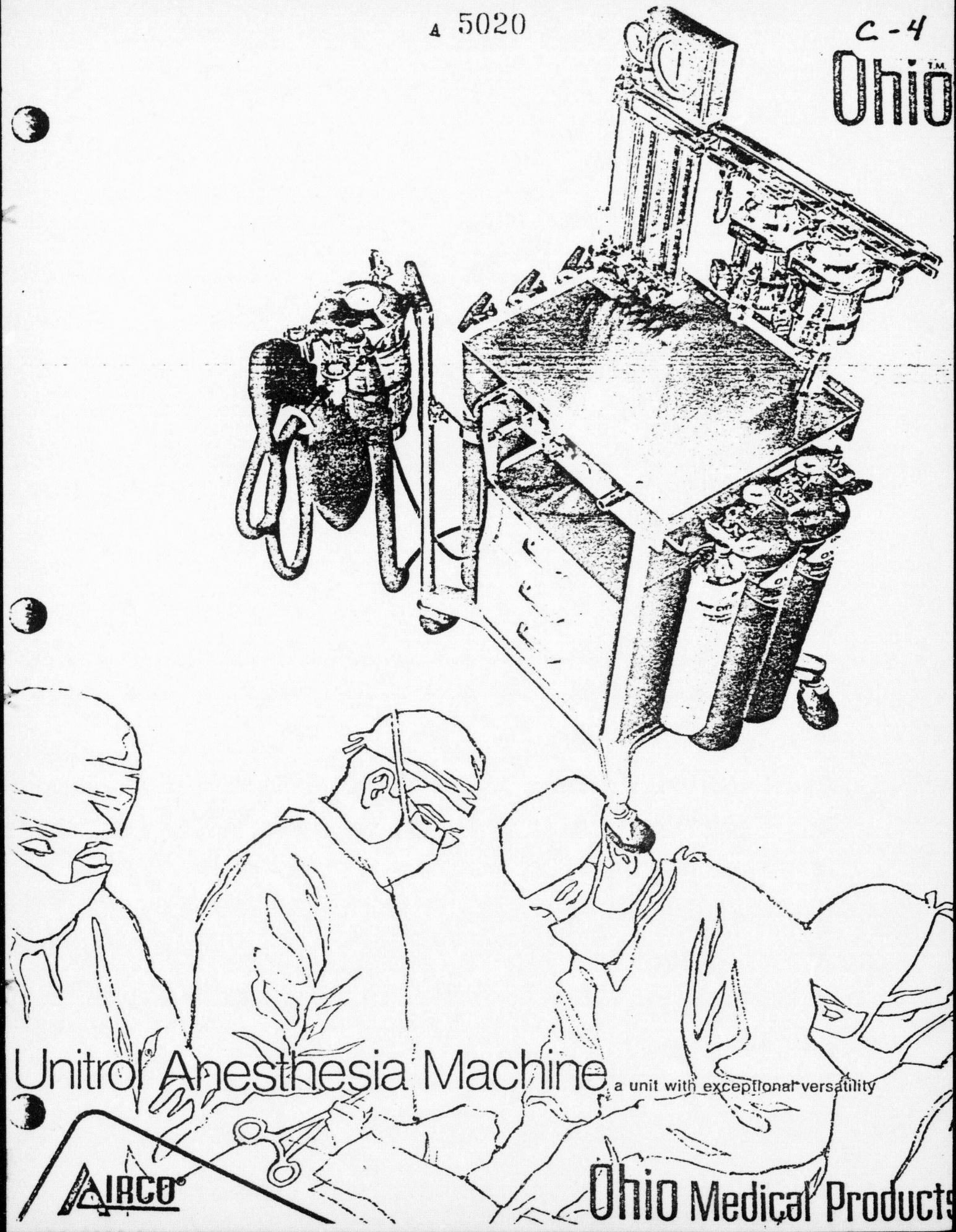

Tycos Manometer
Ventilator
Side-Arm Vaporizer
Gas Evacuator
Flowmeter Shield
Model 21
Absorber
Disposable
Breathing
Circuit
Drawer
Kit

A 5020

C-4

Ohio™



Unitrol Anesthesia Machine

a unit with exceptional versatility

AIRCO®

Ohio Medical Products

A 5021

other vaporizer options you can consult your Ohio representative about . . .

Bubble-Thru Vaporizer	Stock No. 309-0214-800
Side-Arm Vaporizer	Stock No. 216-6356-882
Fluotec Mark II Vaporizer	Stock No. 309-0275-300
Fluotec Mark III Vaporizer	
Less F. S. pin safety system	Stock No. 309-0280-300
With F. S. pin safety system	Stock No. 309-0281-300
Pentec Mark I Vaporizer	Stock No. 309-0277-300
Pentec Mark II Vaporizer	
Less F. S. pin safety system	Stock No. 309-0282-300
With F. S. pin safety system	Stock No. 309-0283-300
Fluoromartec Vaporizer	Stock No. 309-0276-300

mounting kit — required between vaporizer and back trolley bar

For Pentec II & Fluotec III (Included, No Charge)	Stock No. 219-7320-870
For Pentec I, Fluotec II & Fluoromartec I	Stock No. 402-1000-530

power outlets

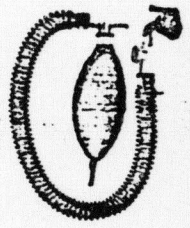
	O_2	Air
Diamond	216-6410-870	216-6411-880
Schrader	216-6410-871	216-6411-881
D.I.S.S.	216-6410-872	216-6411-882

trolley bar extension kits — For the correct trolley bar extension kit required for three vaporizer combinations consult your Ohio representative.

Long Trolley Extension Kit	Stock No. 216-6417-870
Extra-Long Trolley Extension Kit	Stock No. 216-6417-871

nitrous oxide flush valve Stock No. 216-6330-870

open circuit kit (illustrated) — Includes non-rebreathing valve and adapters, but without rubber goods Stock No. 216-6460-880



monitoring shelf — Top mounted, adjustable to either above or below the five-foot level Stock No. 216-6418-870

FIRST VAPORIZER	SECOND VAPORIZER: # 10	PENTEC I	PENTEC II	FLUORO-MARTEC I	FLUOTEC II	FLUOTEC III	NONE
SIDE-ARM	A	A	A	A	A	A	B
# 10	—	A	A	A	A	A	B
PENTEC I	D	—	—	A	A	C	B
PENTEC II	D	—	—	A	A	C	B
FLUOTEC II	D	D	D	A	—	—	B
FLUOTEC III	D	D	D	A	—	—	B
FLUOROMARTEC I	D	D	D	—	D	D	B

(A) 204-5364-530 Adapter, 22mm Taper 1½" Long; (B) 216-6490-880 Adapter, 22mm Taper Variable 6" to 10"; (C) Not Required; (D) Mounting Sequence Not Recommended.

manifold adapters — the numerous vaporizer combinations require adapters of varying lengths. The more common combinations are structured at left. To determine the correct adapter simply match the vertical and horizontal columns with your choice of vaporizers and compare code letter with Stock Ordering Number. For specific installation instructions or for information on additional combinations not listed consult your Ohio representative.

basic UNITROL anesthesia machine

Two-gas (O_2, N_2O) with one drawer	216-6262-810
Two-gas (O_2, N_2O) with three drawers	216-6262-811
Three-gas (O_2, N_2O, C_3H_6) with one drawer	216-6282-810
Three-gas (O_2, N_2O, C_3H_6) with three drawers	216-6282-811
Three-gas (O_2, N_2O, Air) with one drawer	216-6282-812
Three-gas (O_2, N_2O, Air) with three drawers	216-6282-813
Four-gas (O_2, N_2O, C_3H_6, He) with one drawer	216-6292-810
Four-gas (O_2, N_2O, C_3H_6, He) with three drawers	216-6292-811
Four-gas (O_2, N_2O, Air, He) with one drawer	216-6292-812
Four-gas (O_2, N_2O, Air, He) with three drawers	216-6292-813

pipeline inlet connections — Pipeline inlets must be installed before your unit is shipped, therefore, *please specify preferred inlet style when ordering!* (If not specified, D.I.S.S. male fittings will be provided.)

Inlets are priced separately as an accessory but are factory installed at no additional cost.

Style	O_2	N_2O	AIR
Diamond	216-6326-870	216-6326-871	216-6444-871
D.I.S.S.	216-6325-870	216-6327-870	216-6444-870
Schrader	216-6325-871	216-6325-873	216-6444-872
N.C.G.	216-6439-870	216-6439-871	216-6444-874
Puritan	216-6370-880	216-6370-881	216-6444-873

Please refer to the General Price List for latest pricing data.

Ohio Medical Products

P.O. Box 1319, 3030 Airco Drive, Madison, Wisconsin 53701
Cable Address: OHIOMED

EASTERN REGION
95 Cedar Lane, Suite 4
Englewood, New Jersey 07631

MIDWESTERN REGION
209 South Main Street, Suite 201
Mount Prospect, Illinois 60056

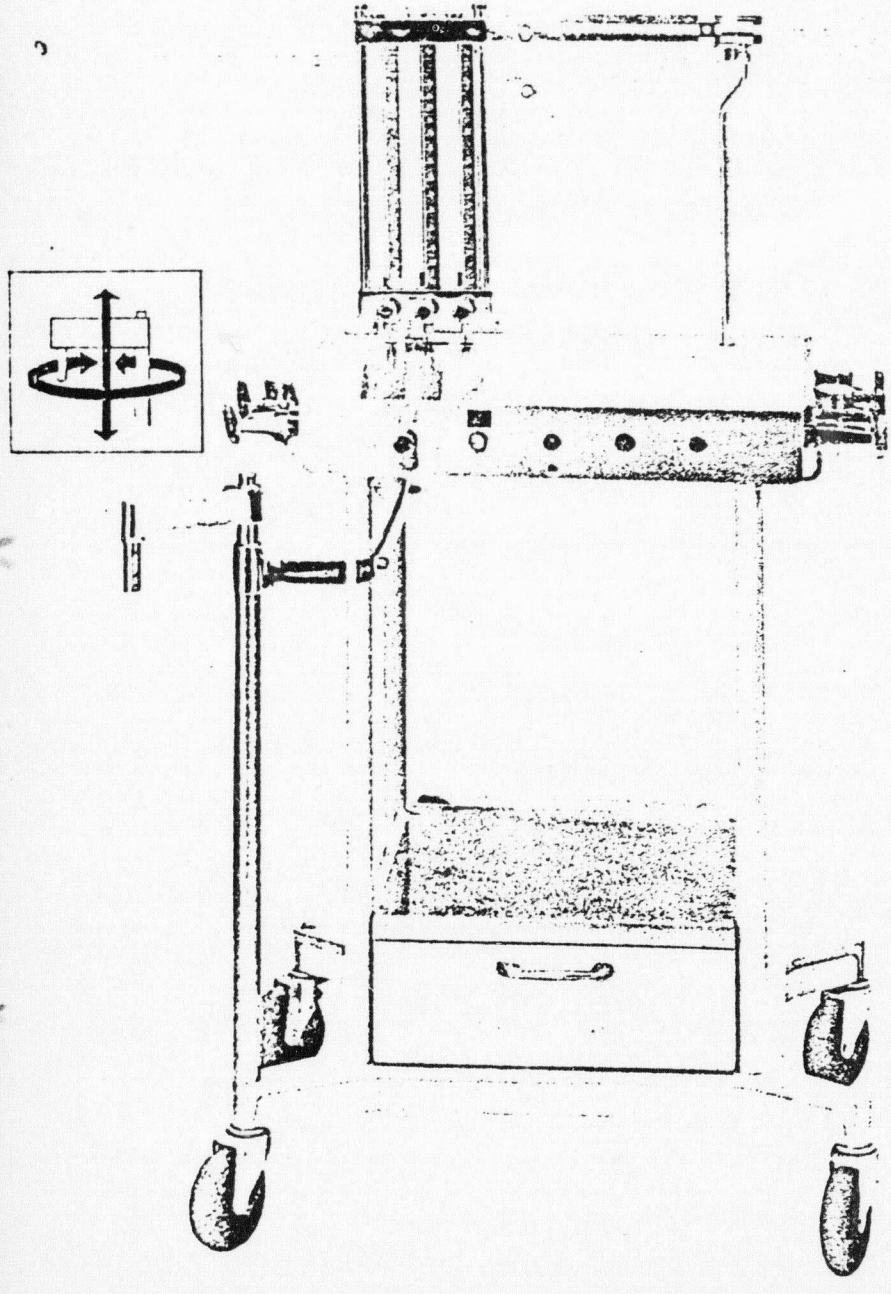
SOUTHERN REGION
2185 Marietta Blvd., N.W.

PACIFIC REGION
1231 Second Street

Ohio Medical Products Canada
895 Hodge Street,
Montreal 379,

AIRCO

basic three gas UNITROL® with single drawer arrangement



standard features

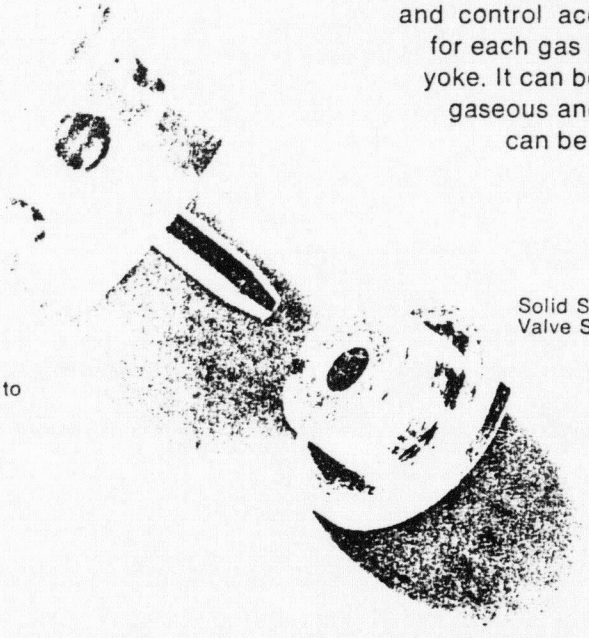
- ... Fail Safe Valves shut off all other gases in the event of oxygen supply failure.
- ... Telescoping absorber post locks in any position within a 19 inch vertical range — absorber can swing within a horizontal arc of 18 inches.
- ... Flow control needle valves and "T" handles are coded with color and gas symbol.
- ... Needle valves have silver seats, Teflon packing and adjustable stops.
- ... Complete chain of conductivity.
- ... 300 square inch 16 gauge stainless steel working surface.
- ... Rubber lined drawers slide easily on metal "U" channels.
- ... Four-inch conductive double ball bearing casters glide effortlessly.
- ... One piece, pin indexed forged brass yokes have a polished chrome finish.
- ... Hand calibrated long-scale 11" flowmeters.
- ... Front mounted oxygen flush valve.
- ... Baked enamel beige finish.
- ... Durable cast aluminum base.

A 5023

The UNITROL anesthesia machine is one of the most popular anesthetic metering devices available today. It holds this preferred position with knowledgeable hospital personnel due to its extreme accessory customizing versatility. It has the ability to satisfy an array of techniques, with a variety of agents, preferred by a cross section of anesthesiologists . . . a truly *practical* machine, which is truly *functional!*

The UNITROL is a precision instrument which incorporates many of the most sought after construction features found in more expensive equipment. These include an open frame, cast aluminum base; convenient trolley bar mounting for vaporizers; extended scale flowmeters to facilitate fine adjustment; huge stainless steel working surface; and a hinged telescoping absorber post which allows both vertical and horizontal positioning.

The UNITROL is also arranged for operator convenience and control accessibility; with separate gauges for each gas located next to the corresponding yoke. It can be equipped for all commonly used gaseous and volatile anesthetic agents which can be administered in a nonrebreathing or closed system.

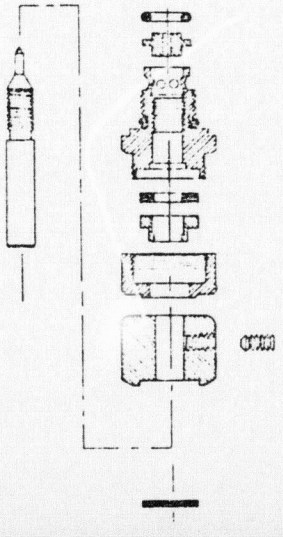


Solid Silver Valve Seats

Needle valves are machined to exacting tolerances for the ultimate in control deftness.

PMA

Ask about the Ohio Preventive Maintenance Plan! It's another method of product backing offered by Ohio to protect your investment and assure your continued satisfaction.



flow control valves

The flow control valves are precisely machined so that any adjustment of the valve is accompanied by a comparable change in the flow rate. The valves are color and symbol coded, have removable stems with Teflon* packing, replaceable silver seats, and built-in adjustable stops. Knobs are large and knurled with ample finger space for easy operation. Valves and flow control knobs are positioned directly below the corresponding flowmeter.

flowmeters

The long-scale (11") flowmeters combine accuracy and readability with long service life. Flowmeters are individually hand calibrated. The large floats are easy to read against the white background. Standard flowmeter calibration ranges are as follows:

NITROUS OXIDE: 300 cc to 12 l.p.m.

OXYGEN: 200 cc to 6 l.p.m.

CYCLOPROPANE: 20 cc to 800 cc

HELIUM (4-gas machines only): 200 cc to 10 l.p.m.

AIR (3 and 4-gas machines only): 1 - 15 l.p.m.

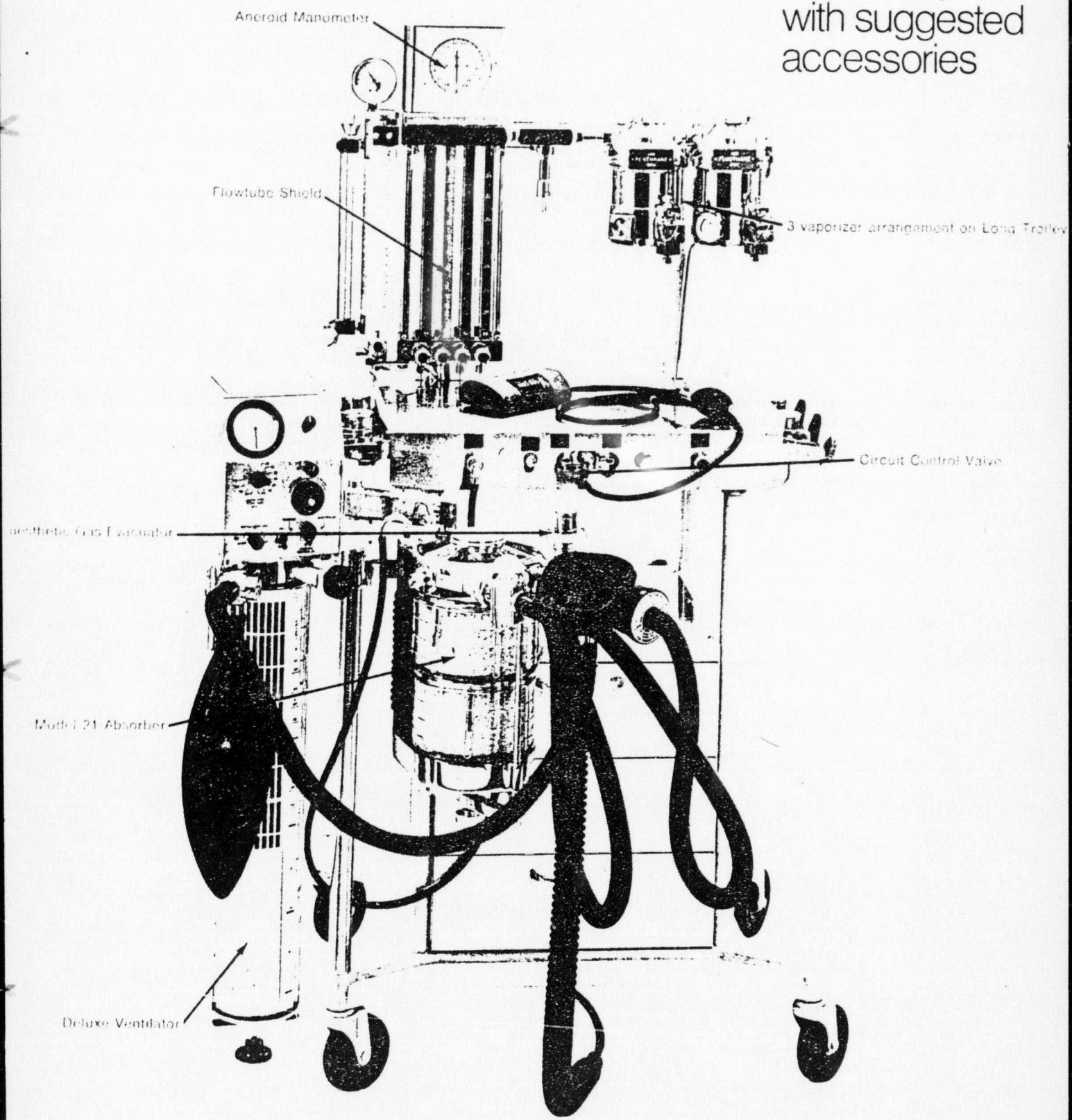
hanger yokes

Double hanger yokes are provided for oxygen and nitrous oxide. Cylinder pressure gauges are provided for each gas. Check valves prevent back flow into the cylinder and facilitate switching cylinders while machine is in use. (Single yokes provided for cyclopropane, helium and air.)

*Registered trademark of E. I. DuPont de Nemours & Co.

A 5024

UNITROL® with suggested accessories



☑ accessories

To realize the full capability of the equipment and the largest degree of personal satisfaction with day-to-day usage, you'll want to consider each of these suggested accessories *carefully* when equipping your unit.

☐ model 21 absorber

This absorber utilizes twin Sodasorb Canister Paks. Its record for trouble-free service and effectiveness has fostered its popularity. It can also be fashioned to suit a variety of needs and preferences. The fully equipped version suggested includes: Inhalation and Exhalation Check Valves, Rebreathing Valve, and a No. 100 Inhaler Valve in conjunction with standard rubber goods. (Ohio's new Disposable Breathing Circuit with integral Swivel "Y" is substituted for latter two items *in the photograph.*) *Order Stock No. 309-0166-881*, or for other styles of absorbers, including the Heid-a-Sorb with remote canister, consult the Ohio Anesthesia Accessories *Catalog No. 1754*.

☐ anesthetic gas evacuator

Protects personnel from exposure to exhausted gases and vaporized agents by directing gases from relief valve to floor level or vacuum pipeline disposal system. To secure the vacuum disposal unit depicted, *Order Stock No. 216-6414-871*, and consult your Ohio *Catalog No. 9844* for hose and adapter data.

☐ vaporizers

Allow yourself some latitude when selecting your vaporizer combination. Anesthetic preferences vary and new agents continue to be developed which may require added capability. Also, your vaporizers won't have to be drained each time a change of agent is desired.

One popular arrangement is: a Fluotec Mark III and a Pentec Mark II for administering Fluothane and Penthrane, and a Side-Arm Vaporizer for the other agents of your choice. *For this combination specify Stock Nos. 309-0281-300, 309-0283-300 and 216-6356-882* respectively with two *Mounting Brackets No. 402-1000-530*, and one *Long Trolley Extension Kit No. 216-6419-870*.

For other combinations consult the last page of this catalog.

☐ ventilator

This unit provides precise patient ventilation *automatically!* It eliminates "bagging" and frees the anesthesiologist's hands to perform other tasks. The Ohio Deluxe Ventilator may be used to supplement the breathing efforts of the patient, or fully ventilate the apneic patient. In addition the ventilator can be volume or pressure controlled.

Order Stock No. 309-0615-600. Hinge Arm and Bracket No. 216-6402-880 with appropriate power outlet from *Catalog No. 1754*.

☐ blood pressure manometer

The Tycos aneroid manometer in stainless steel case is supplied with an adult cuff, bulb, tubing and bladder. *Order Stock No. 216-6445-871* for conductive style (includes the mounting bracket).

☐ flowmeter shield

A static dissipating Homalite† shield protects the flowtubes against breakage and helps prevent dirt and dust from accumulating around otherwise exposed areas. Ask your Ohio representative to include on your order. Detailed in *Catalog No. 1849*.

☐ circuit control valve

Switches gas mixture from the absorber outlet to the open circuit outlet. *Stock No. 216-6461-870*.

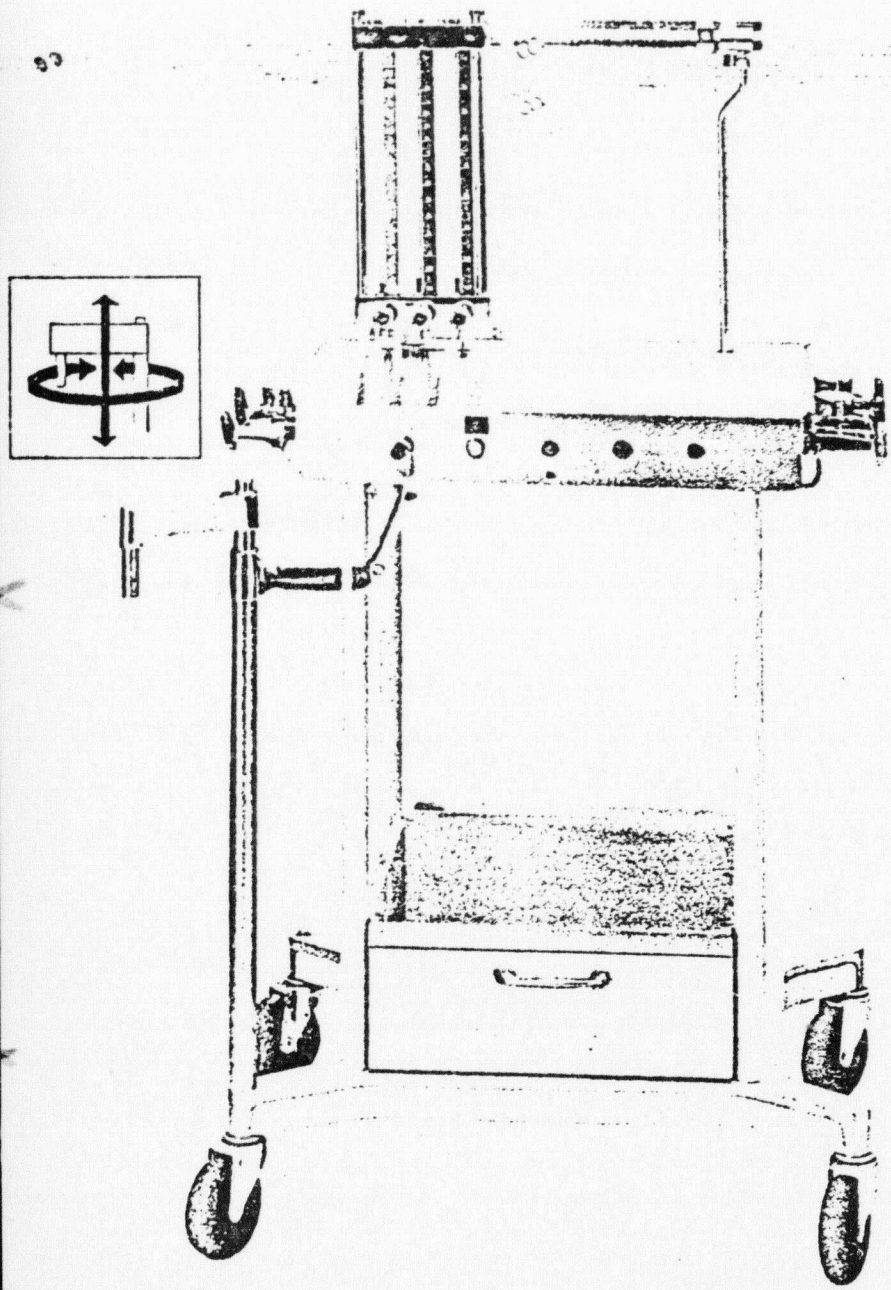
Other Accessories and Consumable Items

For additional information on Ohio's complete array of anesthesia equipment, including the disposable products: breathing circuits, endotracheal tubes and airways, ask for *Catalog No. 40*.

† A Trademark of Homalite Corp.

A 5026

basic three gas UNITROL® with single drawer arrangement



standard features

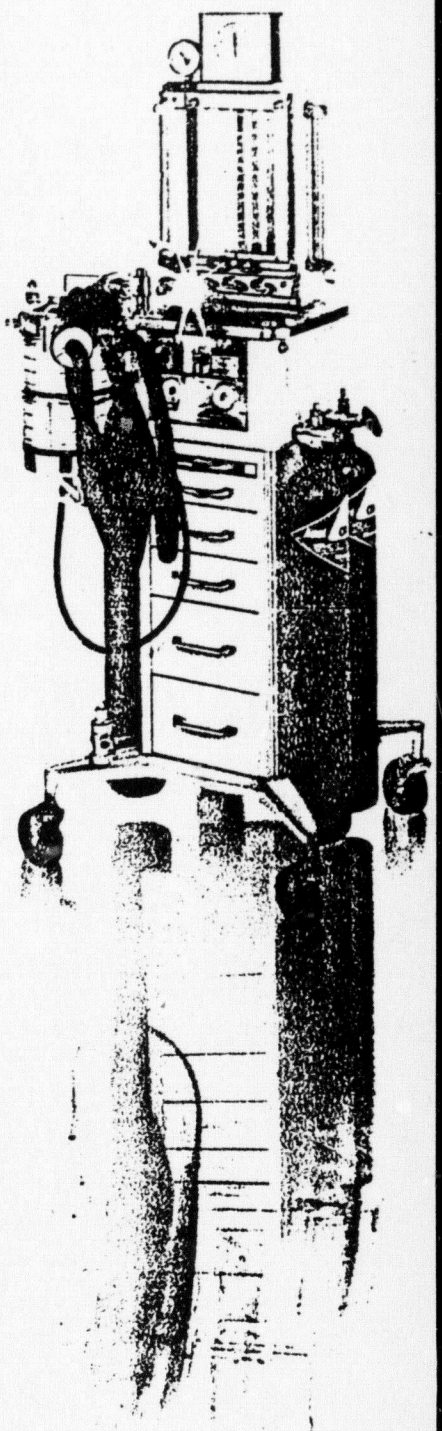
- ... Fail Safe Valves shut off all other gases in the event of oxygen supply failure.
- ... Telescoping absorber post locks in any position within a 19 inch vertical range — absorber can swing within a horizontal arc of 18 inches.
- ... Flow control needle valves and "T" handles are coded with color and gas symbol.
- ... Needle valves have silver seats, Teflon packing and adjustable stops.
- ... Complete chain of conductivity.
- ... 300 square inch 16 gauge stainless steel working surface.
- ... Rubber lined drawers slide easily on metal "U" channels.
- ... Four-inch conductive double ball bearing casters glide effortlessly.
- ... One piece, pin indexed forged brass yokes have a polished chrome finish.
- ... Hand calibrated long-scale 11" flowmeters.
- ... Front mounted oxygen flush valve.
- ... Baked enamel beige finish.
- ... Durable cast aluminum base.

A5027 C-5

Ohio®

compact anesthesia machine

SERIES 4000 STAND AND CART MODELS



Airco Ohio Medical Products

A 5028

Ohio's Series 4000 Compact Anesthesia Machine meets the exacting requirements of the skilled anesthesiologist while taking less than two and one half square feet of floor space.

Precise, easy to read eleven-inch flowmeters measure the flow of anesthetic gases. The Verni-trol Vaporizer affords the ultimate in accurate delivery of anesthetic vapor to the patient circuit.

Rugged, versatile construction design allows the use of a wide range of optional equipment.

the compact

making the Series 4000 Anesthesia Machine complete for all surgical anesthesia procedures.

The need for precise administration of anesthetic agents combined with tight space limitations common in X-ray, obstetrics, cysto and special procedures areas as well as in the operating room makes the series 4000 the logical choice.

how to order

SERIES 4000 SPECIFICATIONS

Dimensions . . . . . 24" x 23" x 57"
Approximate Shipping Weight . 180 lbs.
Regulators (O_2, N_2O) . . . . . 37 p.s.i.g.
Needle Valves (color and symbol coded)
- O_2 2
- O_2 thru Verni-Trol 1
- N_2O 1
- C_3H_6 1

Flowmeters . . . . . 5 (11")

PIPELINE INLET CONNECTIONS

(Please specify or D.I.S.S. will be supplied)

O_2
- Diamond 216-6436-872
- Schrader 216-6436-871
- D.I.S.S. 216-6436-870

N_2O
- Diamond 216-6436-875
- Schrader 216-6436-874
- D.I.S.S. 216-6436-873

PRICES: *Please refer to the General Price List for latest pricing data.*

al Products Canada
t Montreal 379, Quebec

AIRCO®

A 5029

MODELS	STOCK NUMBERS	
Basic Stand Model 4333	216-6178-800	
Basic Cart Model 4303	216-6179-800	
SUGGESTED MAJOR OPTIONS		
Aneroid B. P. Manometer (Tycos)	216-6445-870	
B. P. Manometer Mounting Bracket for		
Machines w/o Flowmeter Shield	216-6339-870	
Machines with Flowmeter Shield	216-6339-871	
Right-hand mounting for machines with thermometer on Verni-Trol	216-6404-870	
Mercury Column B. P. Manometer with		
Left-hand mounting	216-6448-870	
Right-hand mounting	216-6448-871	
Side-Kick B. P. Cuff Inflator	216-6346-871	
Flowmeter Shield for		
Machines w/o Side-Arm Vaporizer	216-6425-876	
Machines with Side-Arm Vaporizer	216-6426-876	
Side-Arm Vaporizer	216-6356-880	
O_2 Power Outlet (Specify)		
Diamond	216-6412-870	
Schrader	216-6412-871	
D.I.S.S.	216-6412-872	
Anesthesia Suction Unit	216-6372-802	
Absorber, Model 21 (complete with rubber goods)	309-0166-881	
Anesthesia Gas Evacuator/Relief Valve (refer to Form #547 for additional components needed for gas evacuation)	207-8172-800	
Disposable Conductive Anesthesia Breathing Circuits	See Form No. 1852	
Ohio Anesthesia Ventilator	309-0612-800	
Floor Stand (four wheel base)	311-0007-870	
Hinge-Arm Mounting Kit (for 1" Absorber Post)	216-6402-883	
OTHER ACCESSORIES		
Thermometer for Verni-Trol Vaporizer	216-6408-870	
No. 8 Vaporizer	309-0201-801	
2-Drawer Kit	216-6433-800	
3-Drawer Kit	216-6433-801	
5-Drawer Kit (w/lock and stainless steel tray)	216-6435-800	
Handle Kit (full width)	216-6434-870	

how to order

SERIES 4000 SPECIFICATIONS

Dimensions . . . . . 24" x 23" x 57"
Approximate Shipping Weight . 180 lbs.
Regulators (O_2, N_2O) . . . . . 37 p.s.i.g.
Needle Valves (color and symbol coded)
O_2 2
O_2 thru Verni-Trol 1
N_2O 1
C_3H_6 1
Flowmeters . . . . . 5 (11")

PIPELINE INLET CONNECTIONS

(Please specify or D.I.S.S. will be supplied)

O_2
Diamond 216-6436-872
Schrader 216-6436-871
D.I.S.S. 216-6436-870

N_2O
Diamond 216-6436-875
Schrader 216-6436-874
D.I.S.S. 216-6436-873

PRICES: *Please refer to the General Price List for latest pricing data.*

Ohio Medical Products

P.O. Box 1419, 3030 Airco Drive, Madison, Wisconsin 53701
Cable Address: OHIOMED

EASTERN REGION
95 Cedar Lane
Englewood, New Jersey 07631

SOUTHERN REGION
2166 Marietta Blvd., N.W.
Atlanta, Georgia 30318

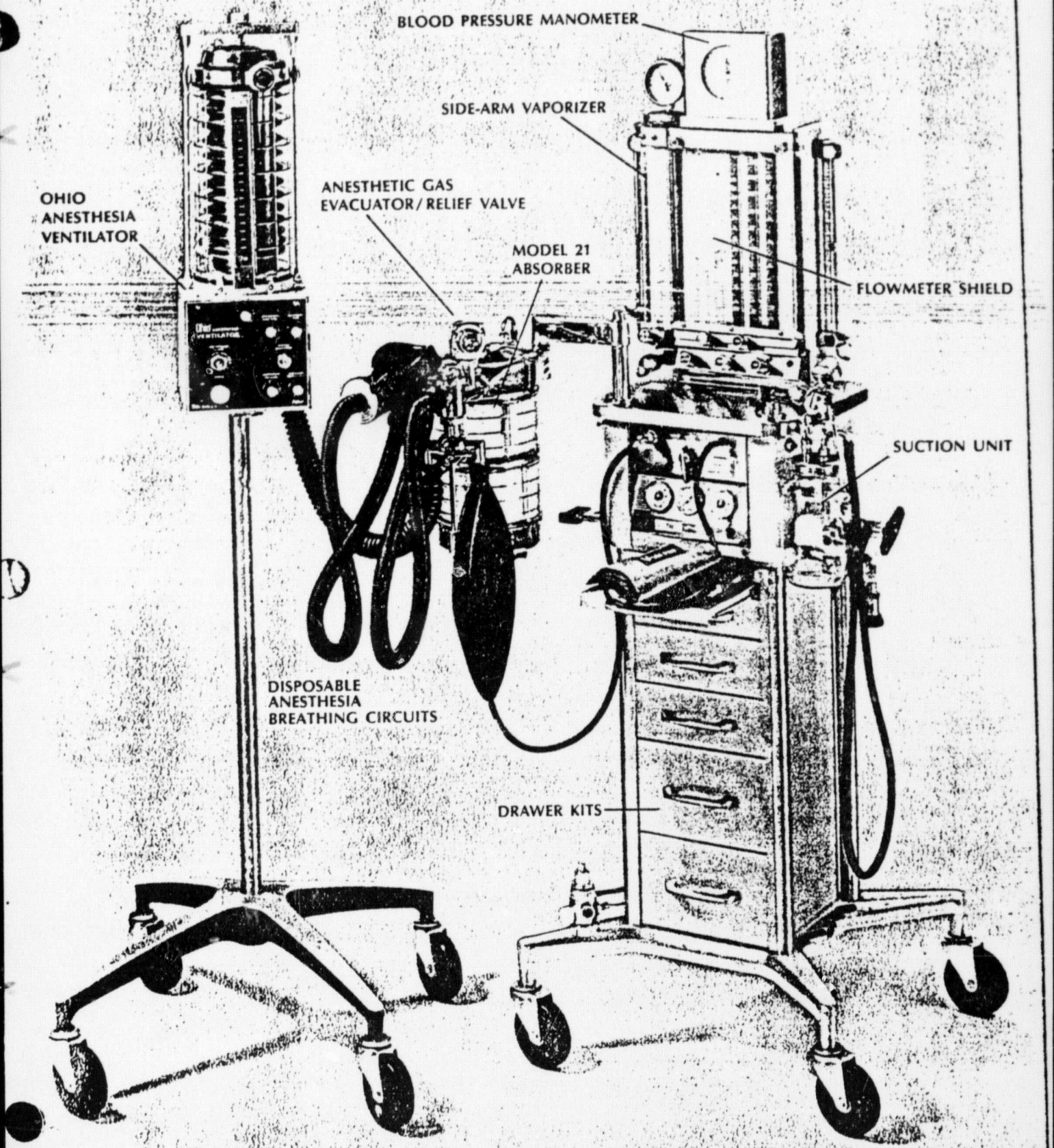
MIDWESTERN REGION
209 South Main Street
Mount Prospect, Illinois 60056

PACIFIC REGION
1231 Second Street
Berkeley, California 94710

Ohio Medical Products Canada
695 Hodge Street, Montreal 379, Quebec

AIRCO

A 5030



* Trademark of E. I. Dupont de Nemours and Company. **Trademark of Homalite Corp., Wilmington, Delaware. †Trademarks of Dewey and Almy, Division of W. R. Grace and Co.

A 5031

standard

FLOWMETERS

■ Five, long-scale, hand-calibrated flowmeters are standard on the Compact. Two separate eleven-inch flowmeters are provided for oxygen and one each for oxygen through the Verni-trol, nitrous oxide and cyclopropane. Large visible floats are easily and accurately read against a white background beside color coded scales.

Standard calibrations include:
Oxygen 20-700 cc and 400 cc to 6 l.p.m.
Verni trol Oxygen 20-900 cc
Nitrous Oxide 500 cc—12 l.p.m.
Cyclopropane 20-750 cc

■ Pressure Sensor System automatically shuts off all gases for patient safety in the event the oxygen supply is interrupted.

■ Telescoping absorber post locks in any position within a 19-inch vertical range while allowing the absorber to be positioned anywhere within an 18-inch arc.

■ Needle valves have silver seats, Teflon* packing and adjustable stops for positive shut off, smooth operation and a long, reliable life. Flows are quickly changed without bobbing. And the rugged construction reduces down time as well as overall costs.

■ A complete chain of conductivity.

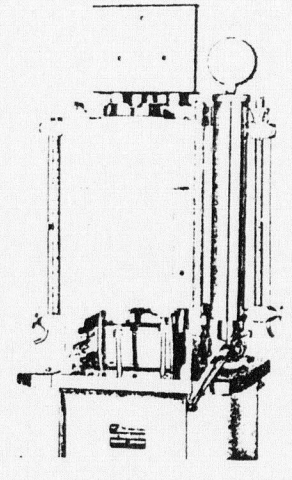
■ One-piece, pin-indexed brass yokes with chrome finish assure a long, trouble-free life and ease of cleaning. A pair of oxygen and nitrous oxide yokes are provided along with a single yoke for cyclopropane or helium.

VERNI-TROL* VAPORIZER

The Verni-trol is a versatile, universal-type vaporizer adaptable to all anesthetic agents. It is an out-of-circuit type vaporizer which is the method whereby the carrier gas bubbles through the liquid agent.

High vapor concentrations are supplied in an oxygen carrier which in turn are accurately diluted with more oxygen or other carrier gases. The large, 600 cc, liquid capacity of the vaporizer is sufficient for longer procedural work.

A tunnel-type access cover, captive filler plug, full length liquid level indicator and drain cock are integral parts of the Verni-trol.



PMA PREVENTIVE MAINTENANCE AGREEMENT...*ask about the Ohio Preventive Maintenance Plan. It's another innovative method of product backing offered to protect your investment and assure your continued satisfaction.*

optional

The following major accessories are recommended for the Compact. Please refer to the "How to Order" section for stock numbers. For additional information on these and other accessories request the Ohio General Anesthesia Apparatus & Accessories Catalog Number 40.

☐ SIDE-ARM VAPORIZER

A second vaporizer is an important addition to the Compact Anesthesia Machine and should be considered with the initial purchase. Anesthetic preferences vary and new agents continue to be developed which may require this added capability.

The Side-Arm Verni-trol Vaporizer is the perfect companion to the standard Verni-trol Vaporizer. It utilizes the same fundamental principles of design and consistently produces accurate concentrations of vapor over extended periods. It also makes it unnecessary to drain the Verni-trol Vaporizer each time a change of agent is desired.

☐ FLOWMETER SHIELD

A static dissipating Homalite** shield protects the flow tubes against breakage and prevents dirt and dust accumulation on the flowmeters.

☐ BLOOD PRESSURE MANOMETERS

The Tycos Aneroid Blood Pressure Manometer fits atop the Series 4000 Anesthesia Machine. It comes complete with an adult cuff, bulb, tubing and bladder. A mercury column type blood pressure manometer is also available.

☐ DRAWER KITS

A five-drawer kit, complete with stainless steel writing tray and drawer lock is recommended for machines equipped with a Model 21 Absorber.

☐ MODEL 21 ABSORBER

The Ohio Model 21 Absorber is provided with twin interchangeable transparent canisters of break resistant molded plastic which can be changed or inverted in seconds. The canisters incorporate their own flow diffuser and each holds one complete Canister-Pak* of Sodasorb*. A center tension adjustment provides a perfect seal between the canisters. And a full range pressure limiting valve from 3 to 30 mm Hg and full close is included. The fully equipped version includes inhalation and exhalation check valves as well as a rebreathing valve.

☐ OHIO ANESTHESIA VENTILATOR

This unit provides precise patient ventilation automatically. A ventilator eliminates tedious "bagging" and frees the anesthesiologist to perform other necessary tasks. The Ohio Anesthesia Ventilator may be used to supplement the breathing efforts of the patient, or fully ventilate the apneic patient. The new Anesthesia Ventilator can be volume or pressure controlled for added versatility.

☐ ANESTHETIC GAS EVACUATOR/RELIEF VALVE

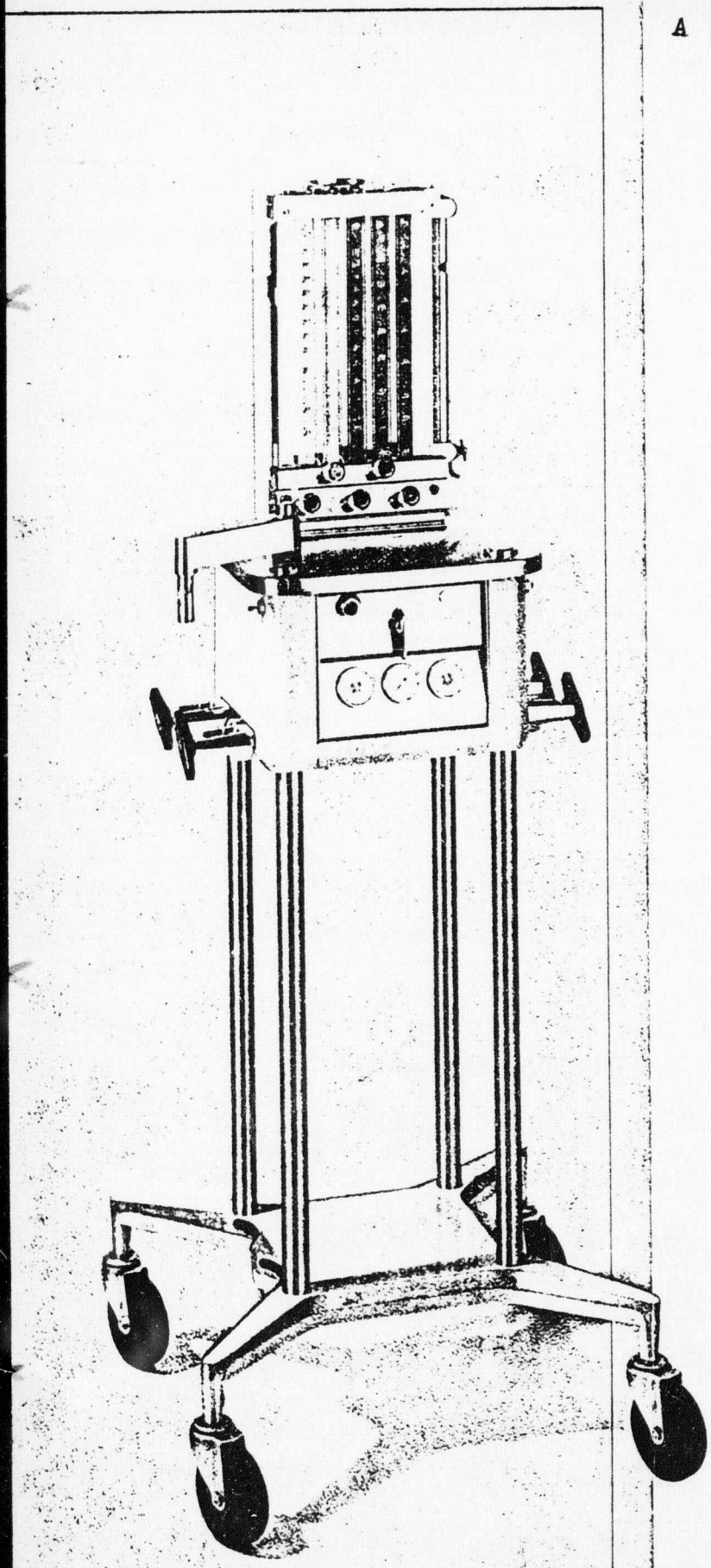
This unit is designed to evacuate exhaust gases and anesthetic agents from the operating room. It controls circuit "pop-off" pressure by an adjusting knob over the range of 2 to 30 mm Hg. The complete system consists of seventeen basic components, two or more of which are needed for any particular method of gas evacuation.

☐ DISPOSABLE ANESTHESIA BREATHING CIRCUITS

Ohio's new disposable breathing circuits are inexpensive enough to be used in all general anesthesia procedures. The conductive breathing circuits include a 0.5 micron bacteria retentive filter which helps prevent cross-infection. The lightweight tubing is extremely flexible and includes a built-in swivel "Y."

☐ SUCTION UNIT

The Anesthesia Suction Unit is supplied complete with bottle, gauge, aspirating tubing with tip and mounting adaptor. It puts suctioning capabilities at your fingertips. The entire unit is easily dismantled for cleaning and autoclaving.



A 5032

standard

FLOWMETERS

■ Five, long-scale, hand-calibrated flowmeters are standard on the Compact. Two separate eleven-inch flowmeters are provided for oxygen and one each for oxygen through the Verni-trol, nitrous oxide and cyclopropane. Large visible floats are easily and accurately read against a white background beside color coded scales.

Standard calibrations include:

Oxygen 20-700 cc and 400 cc to 6 l.p.m.
Verni-trol Oxygen 20-900 cc
Nitrous Oxide 500 cc – 12 l.p.m.
Cyclopropane 20-750 cc

■ Pressure Sensor System automatically shuts off all gases for patient safety in the event the oxygen supply is interrupted.

■ Telescoping absorber post locks in any position within a 19-inch vertical range while allowing the absorber to be positioned anywhere within an 18-inch arc.

■ Needle valves have silver seats, Teflon* packing and adjustable stops for positive shut off, smooth operation and a long, reliable life. Flows are quickly changed without bobbing. And the rugged construction reduces down time as well as overall costs.

■ A complete chain of conductivity.

■ One-piece, pin-indexed brass yokes with chrome finish assure a long, trouble-free life and ease of cleaning. A pair of oxygen and nitrous oxide yokes are provided along with a single yoke for cyclopropane or helium.

VERNI-TROL* VAPORIZER

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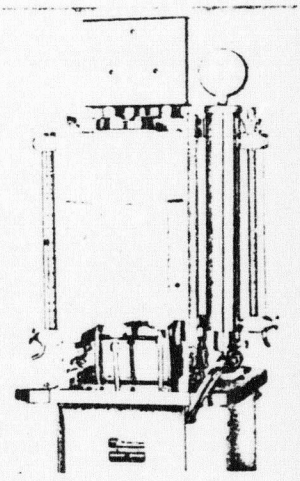


High vapor concentrations are supplied in an oxygen carrier which in turn are accurately diluted with more oxygen or other carrier gases. The large, 600 cc, liquid capacity of the vaporizer is sufficient for longer procedural work.

A funnel-type access cover, captive filler plug, full-length liquid level indicator and drain cock are integral parts of the Verni-trol.

PMA **PREVENTIVE MAINTENANCE AGREEMENT**... *ask about the Ohio Preventive Maintenance Plan. It's another innovative method of product backing offered to protect your investment and assure your continued satisfaction.*

A 5033

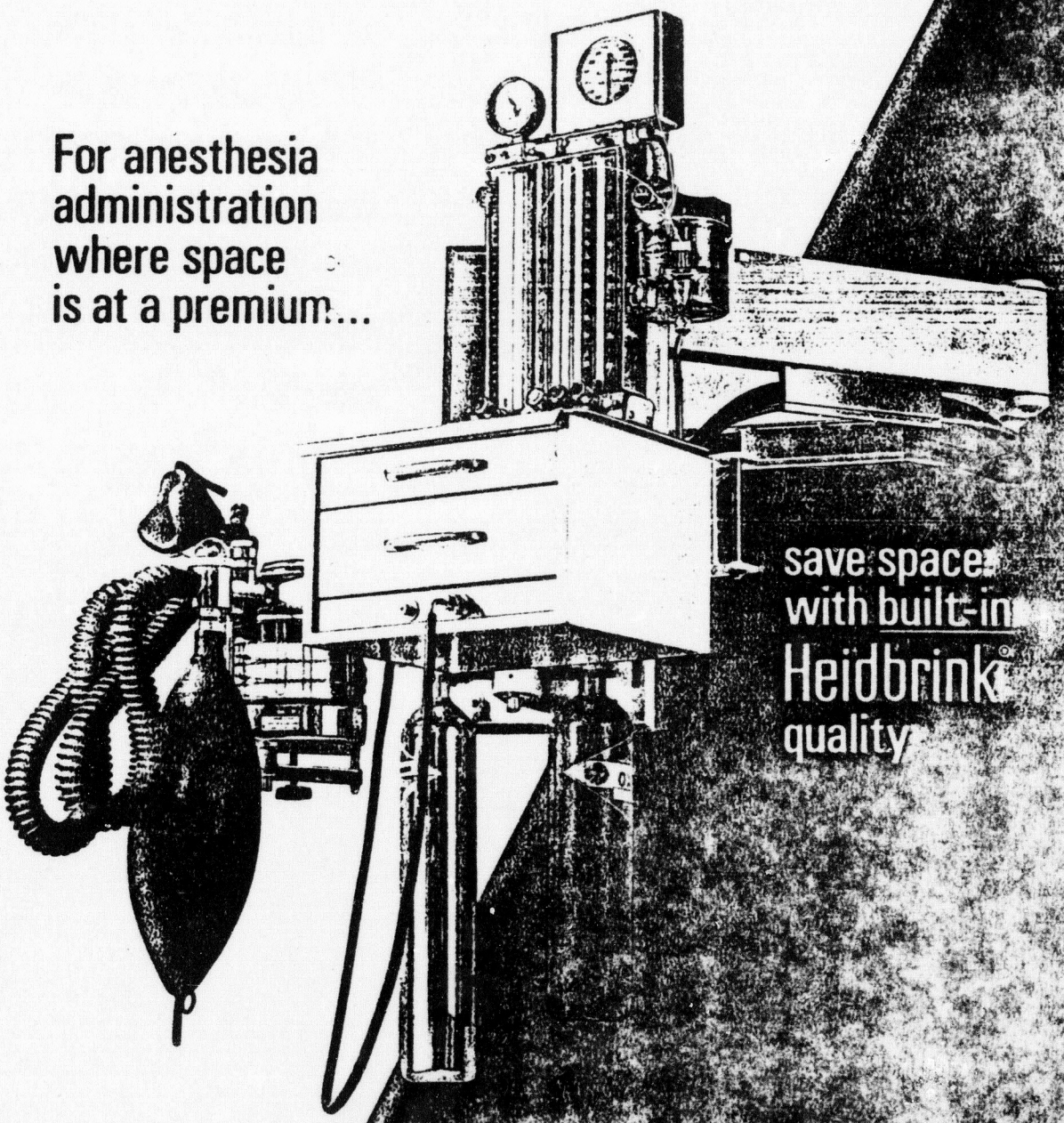
C-6

Ohio™

Ohio Medical Products
July 1972

□15 SPECIAL PIPING SYSTEMS

For anesthesia administration where space is at a premium...

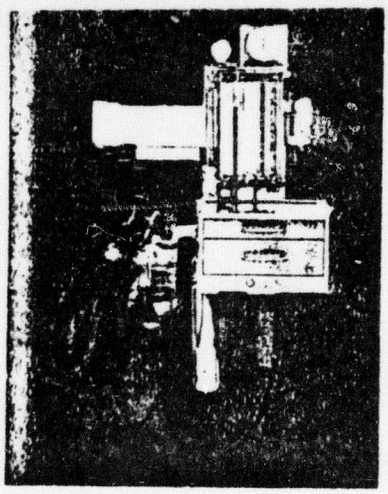


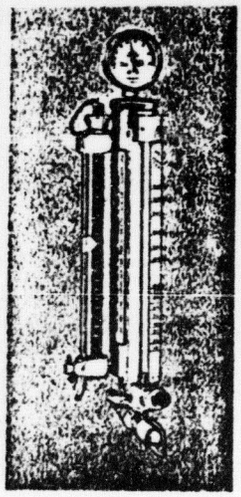
save space with built-in Heidbrink® quality

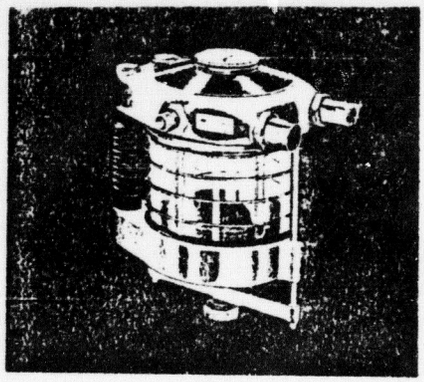
WALL MOUNTED ANESTHESIA MACHINE

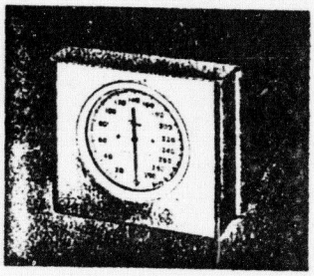
Ohio Medical Products

AIRCO®









A 5034

DESCRIPTION	STOCK NO.
Wall mounted anesthesia machine with double-articulating arm in 3-gas model (O_2, N_2O, C_3H_6)	216-5160-880
Wall mounted anesthesia machine with single arm in 3-gas model (O_2, N_2O, C_3H_6)	216-5160-881
Wall mounted anesthesia machine with double-articulating arm in 2-gas model (O_2, N_2O)	216-5160-882
Wall mounted anesthesia machine with single arm in 2-gas model (O_2, N_2O)	216-5160-883
"Side-Arm" Verni-Trol vaporizer and mounting kit hardware	216-6356-883
Tycos blood pressure manometer kit with adult conductive inflation system	216-6445-870
Mounting kit only for Tycos blood pressure manometer	216-6469-870
Pentec Mark II vaporizer less F.S. Pin Safety System	309-0282-300
Pentec Mark II vaporizer with F.S. Pin Safety System	309-0283-300
Fluotec Mark III vaporizer less F.S. Pin Safety System	309-0280-300
Fluotec Mark III vaporizer with F.S. Pin Safety System	309-0281-300
Mounting kit for Pentec or Fluotec vaporizer	216-6466-870
Model 21 Absorber, Single Canister Version, less rubber goods, less rebreathing valve	309-0151-800
Model 21 Absorber, Double Canister Version, less rubber goods, less rebreathing valve	309-0155-882

Other Accessories

Items such as rubber goods, check valves, rebreathing valve, other Model 21 absorbers with twin canisters, aspirator kit, and other desired accessories must be ordered separately at additional cost. Please refer to the Anesthesia Accessories Catalog, Form No. 1754, and Rubber Goods and Endotracheal Catalog, Form No. 1755.

Please refer to the General Price List for latest pricing data.

Ohio Medical Products

P.O. Box 1319, 3030 Airco Drive, Madison, Wisconsin 53701
Cable Address: OHIOMED

EASTERN REGION
95 Cedar Lane
Englewood, New Jersey 07631

MIDWESTERN REGION
209 S. Main Street
Mount Prospect, Illinois 60056

PACIFIC REGION
1231 Second Street
Berkeley, California 94710

SOUTHERN REGION
2186 Marietta Blvd. N.W.
Atlanta, Georgia 30318

Ohio Medical Products Canada
895 Hodge Street, Montreal 379, Quebec

AIRCO®

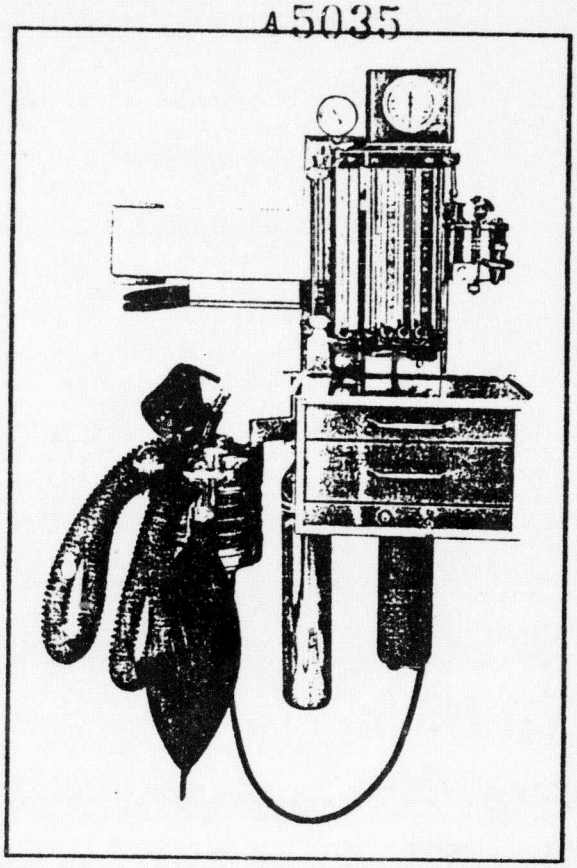
Form No. 1830 (Rev. '72)

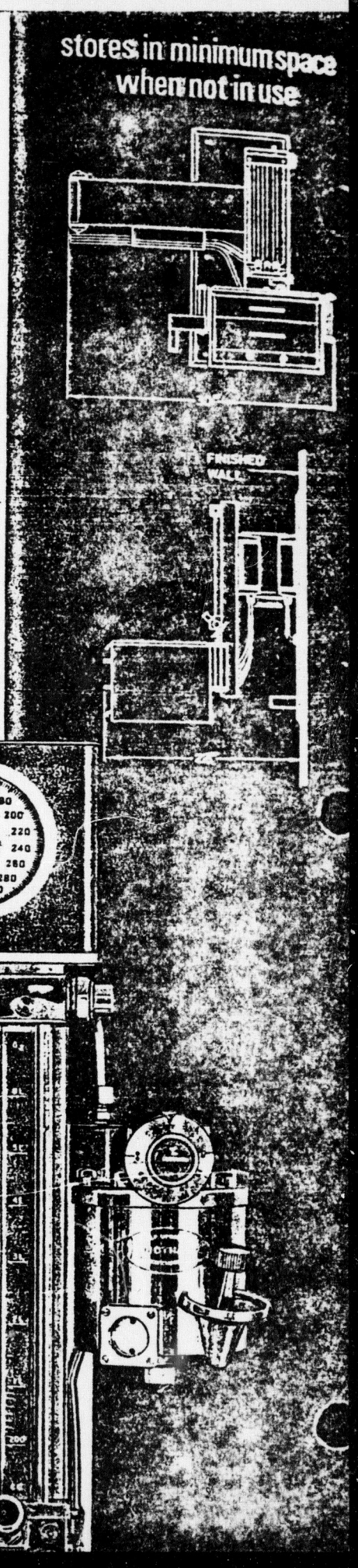
7-72-20

A 5035

Wall mounted convenience keeps the floor clear.

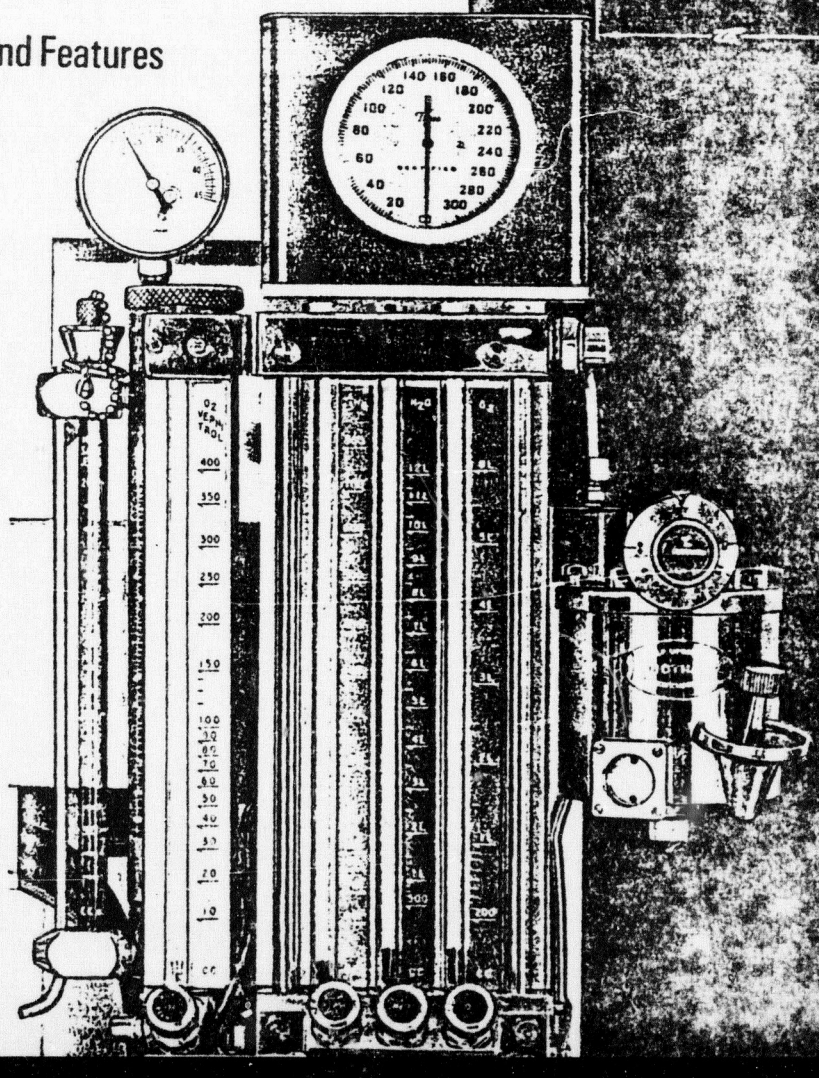
Offers built-in convenience in traditionally crowded areas like cystoscopy; urology; X-ray; induction; obstetrics; emergency; EENT; and dental surgery. Even one less item requiring floor space improves working conditions and enhances safety for the operating team.





With Traditional Heidbrink® Quality And Features

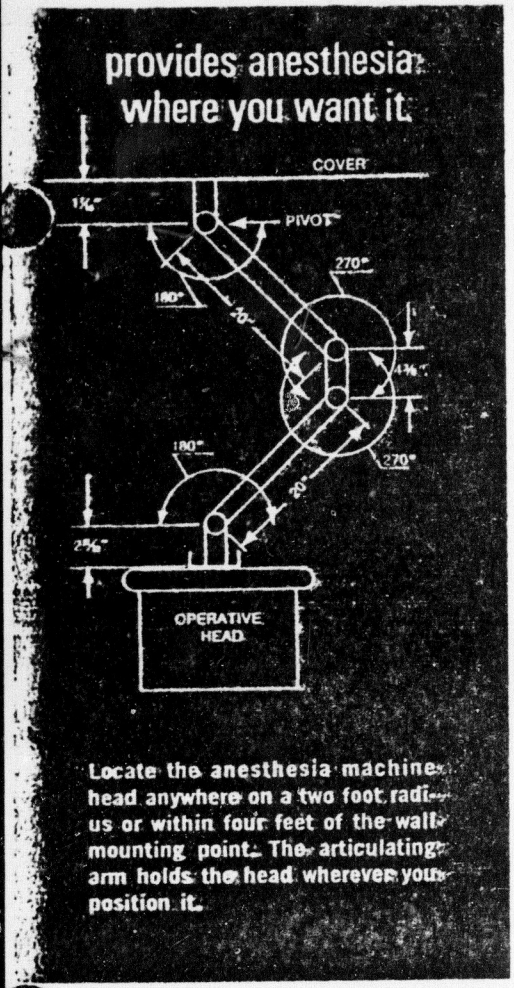
- All units include Fail-Safe Valves as standard equipment. These valves instantly shut off all gases in the event of oxygen supply failure or depletion.
- Long scale 11" flowmeters are protected by a Homalite* shield.
- Gleaming stainless steel and beige baked enamel surfaces clean easily.
- Absorber and ventilator may be right or left hand mounted.
- Two drawers and a cabinet top work surface are standard equipment.
- Machine head may be positioned anywhere on a 2' radius with single arm or within a 4' radius with the double arm model.
- Both the single and the double articulating arms hold the machine head wherever you position it.
- Two gas (O_2, N_2O) version is standard. C_3H_6 is optional.
- Needle valves are easily repaired so the entire valve assembly need not be replaced.
- Yokes for reserve O_2 and working C_3H_6 cylinders and O_2 regulator are included.
- Newly designed O_2 flush valve is self closing.
- Accessories available include Tycos** blood pressure manometer; "Side-Arm"™ Verni-Trol*, Fluotec·, or Pentec· vaporizers, and Model 21 single or double canister absorber.

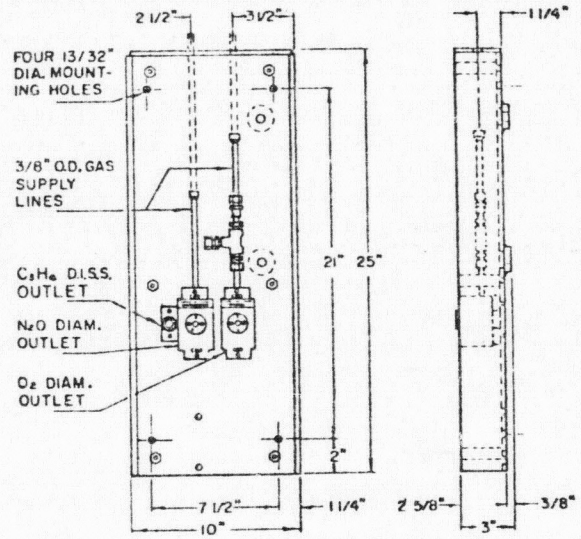


* TM Homalite Corporation
** TM Taylor Instrument Co.
· TM Cyprane, Limited

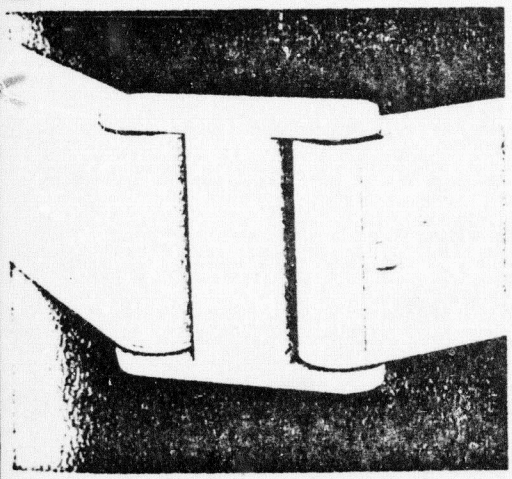
CONSTRUCTION DETAILS

The wall mounted anesthesia machine is designed to connect to piped oxygen and nitrous oxide. The required roughing-in assembly consists of a 10-inch channel iron, 25 inches long, for anchoring inside the support wall. Installation of the wall mounted anesthesia machine requires remodeling of existing facilities or consideration during planning of new facilities. Basic construction details are shown below. Contact Ohio Medical Products Planning Service for assistance in designing your particular installation.



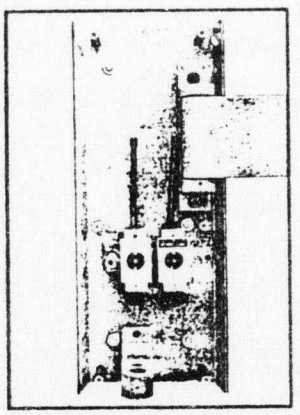


ROUGHING-IN ASSEMBLY

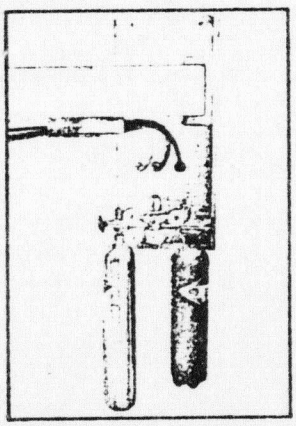


HORIZONTAL PIVOT ASSEMBLY

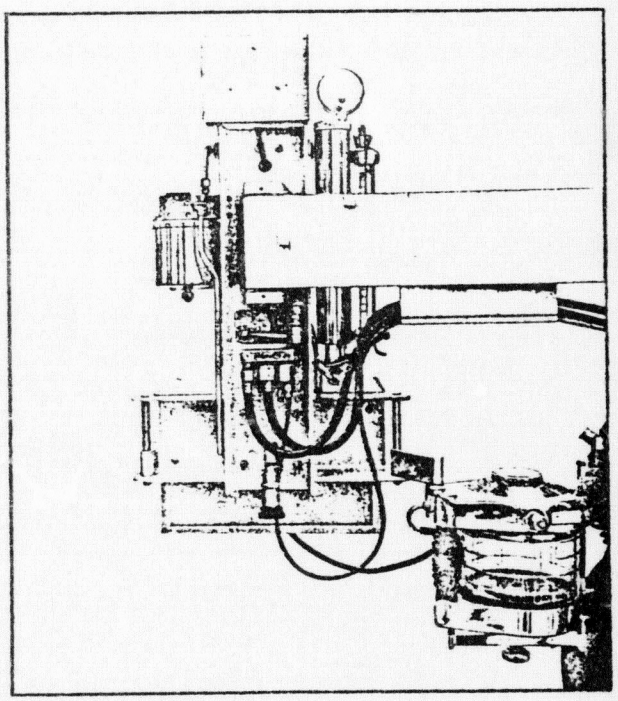
Ruggedly constructed pivot assembly joins hinged arms of tubular aluminum. A total of four pivot points (double articulating arm model only) offers great flexibility in machine positioning and patient orientation.



ROUGHING-IN ASSEMBLY



COVER PLATE SHOWING RESERVE OXYGEN AND WORKING CYCLOPROPANE CYLINDERS



REAR VIEW OF HEAD WITH MODEL 21 SINGLE CANISTER ABSORBER

Strength of construction and details of hose protection are shown above. Accessories included are Tycos blood pressure manometer, Fluotec and "Side-Arm"™ Verni-Trol vaporizers, and the mounting for the Ohio deluxe ventilator.

B00 Rx 2

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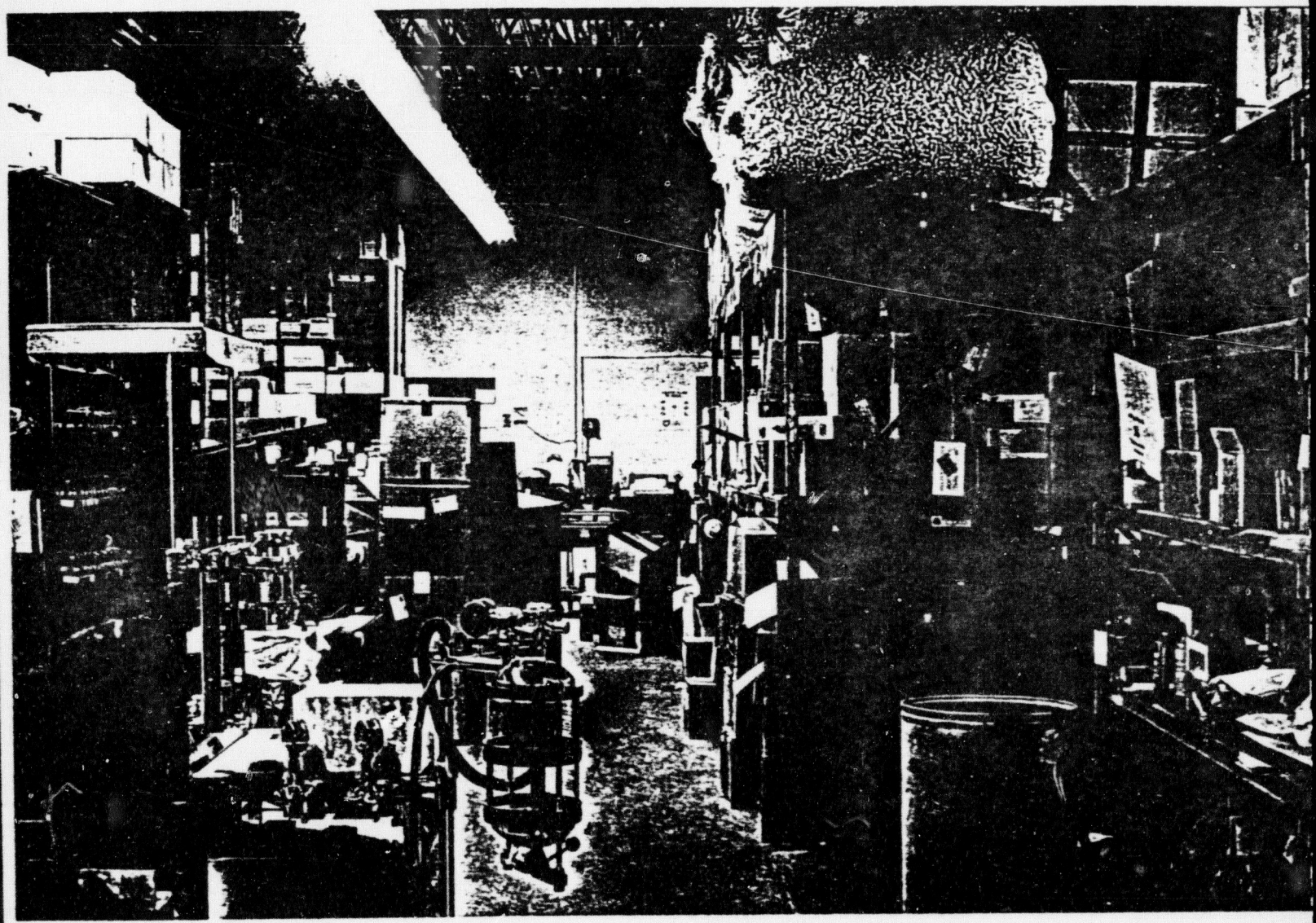

BCC RX 3

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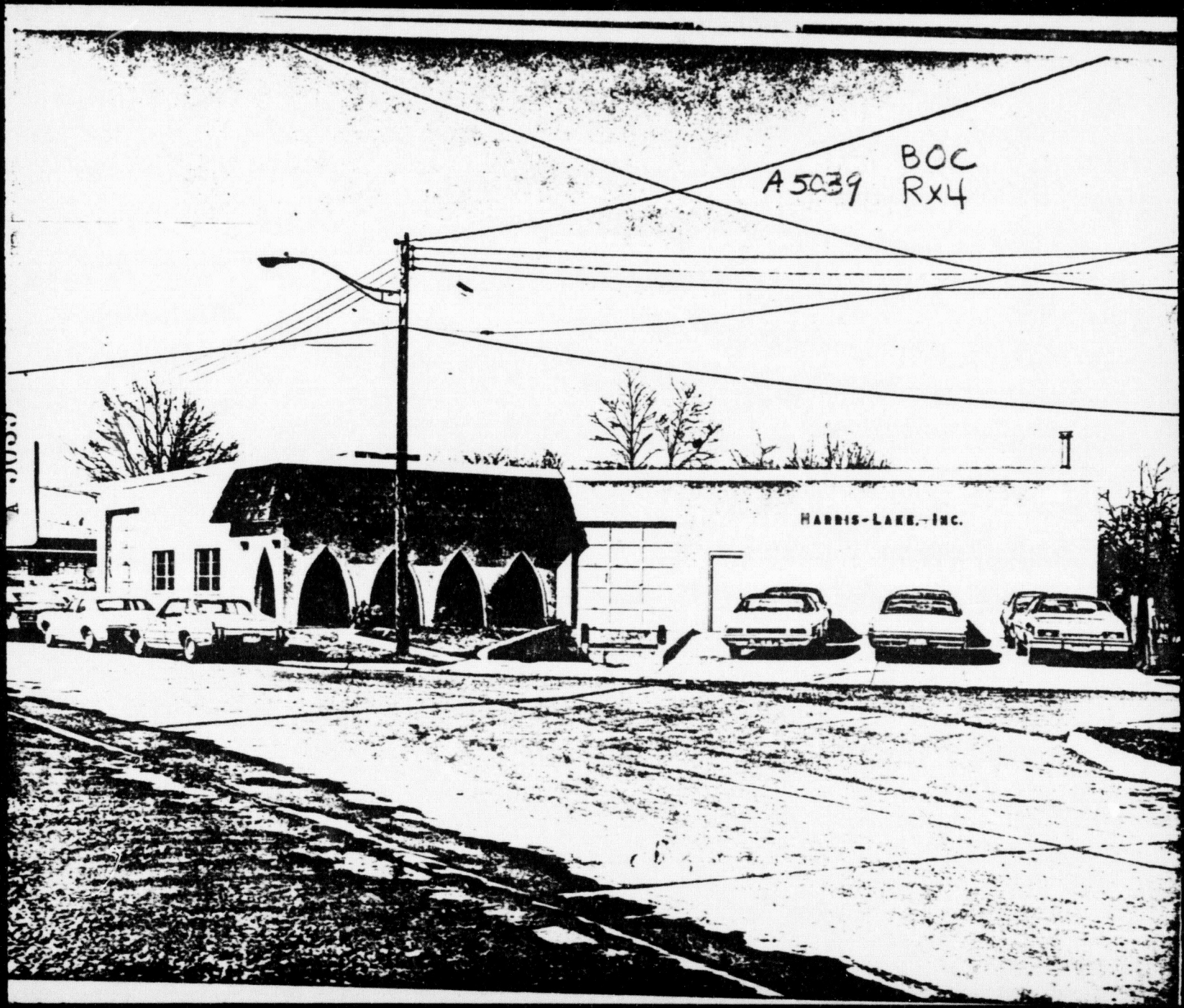
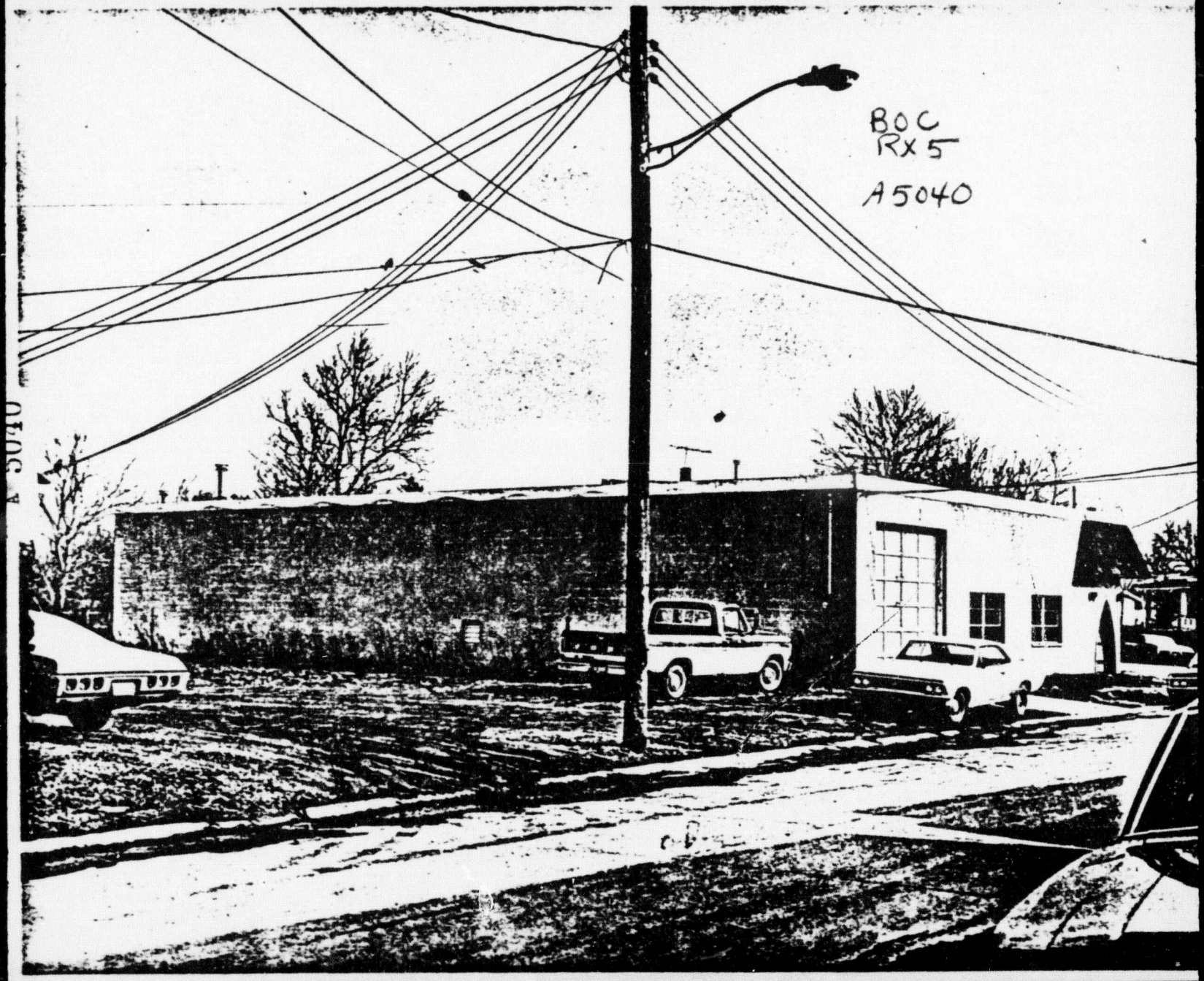

A 5039 BOC Rx4
HARRIS-LAKE, INC.


BOC
Rx 5
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BOC RX 12

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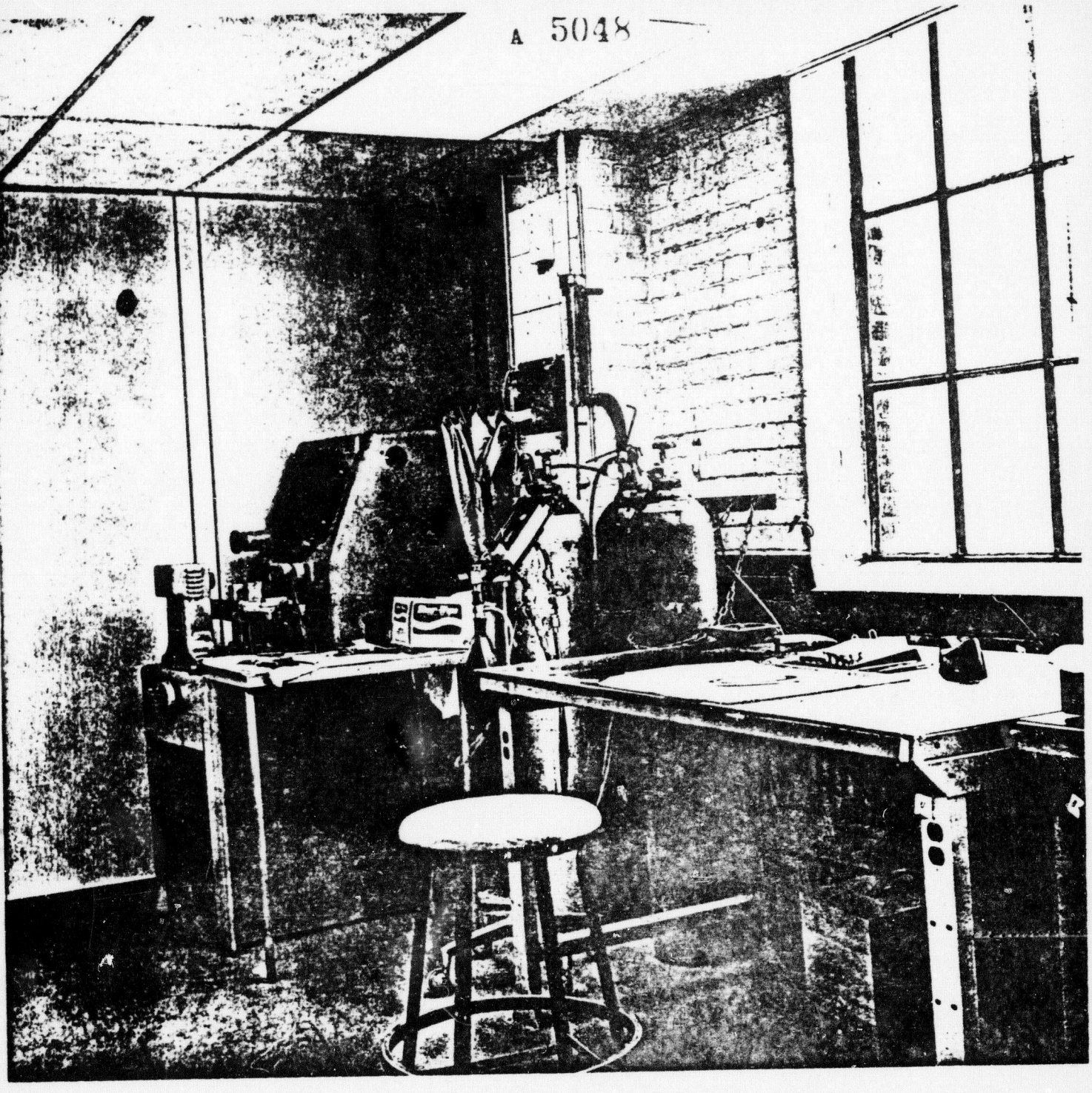
Boc Rx 13

A 5048



BOC RX14

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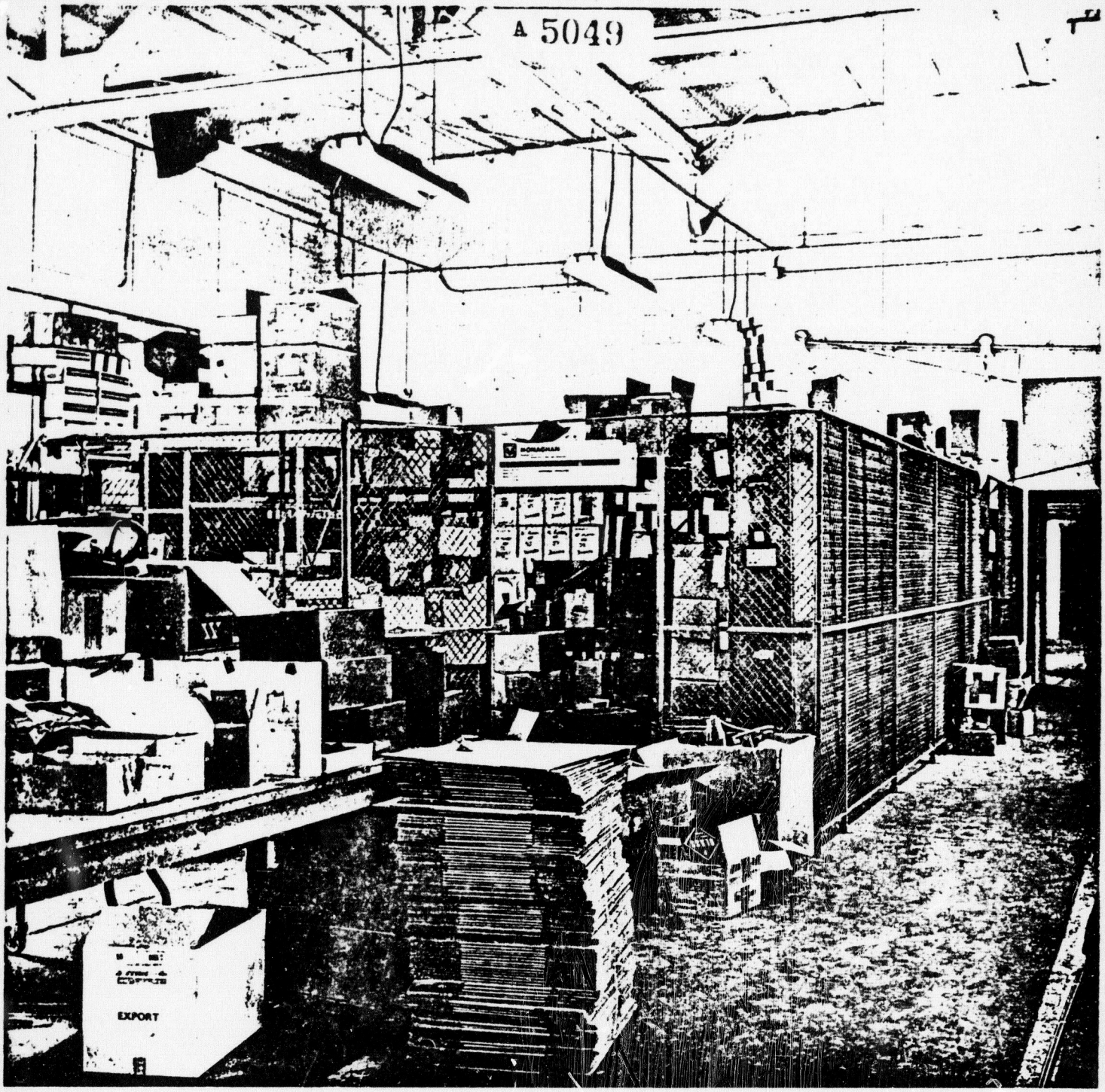

BOC Ex 15

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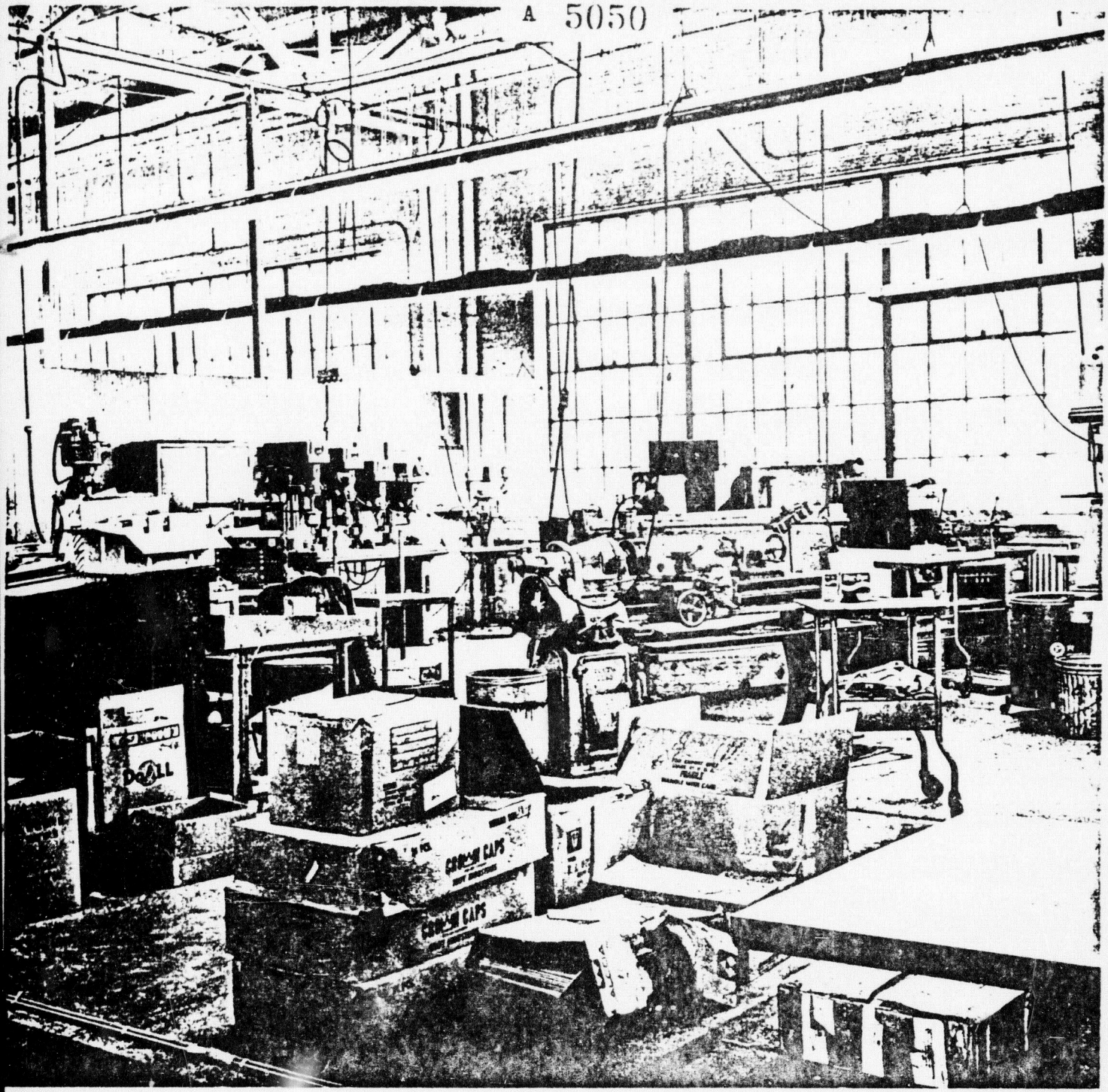
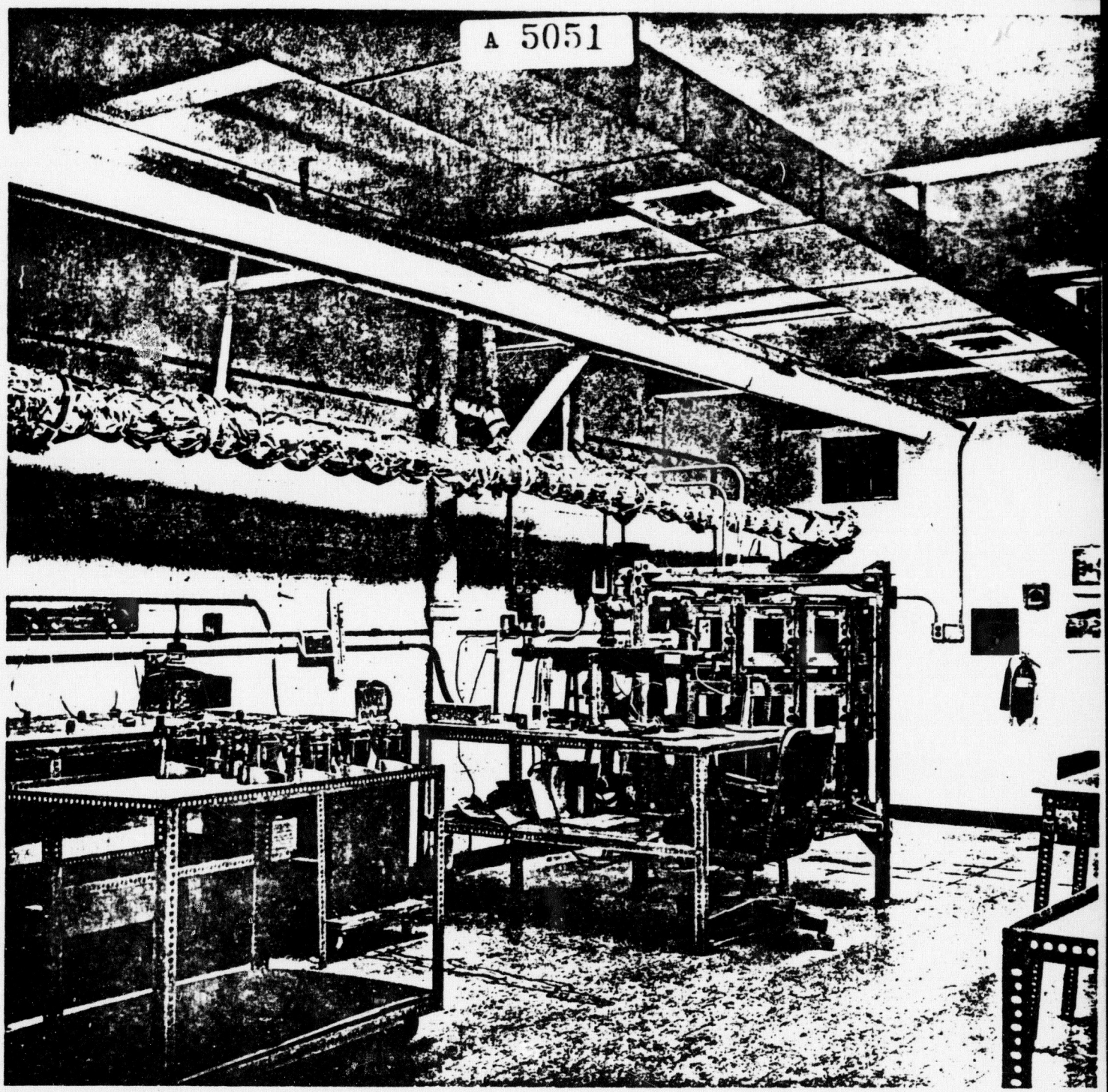


BOC RX 16



BOC Rx 17

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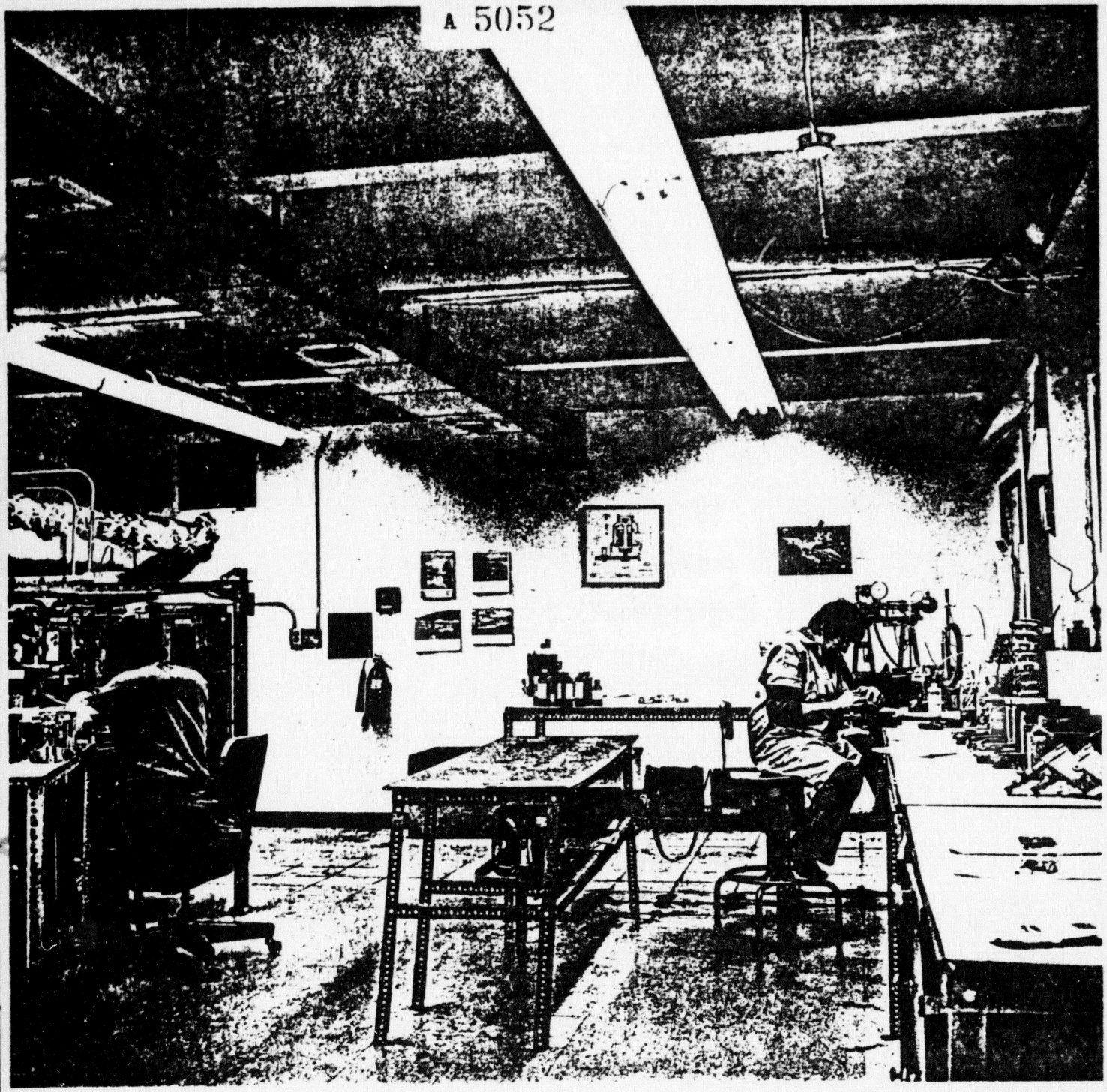

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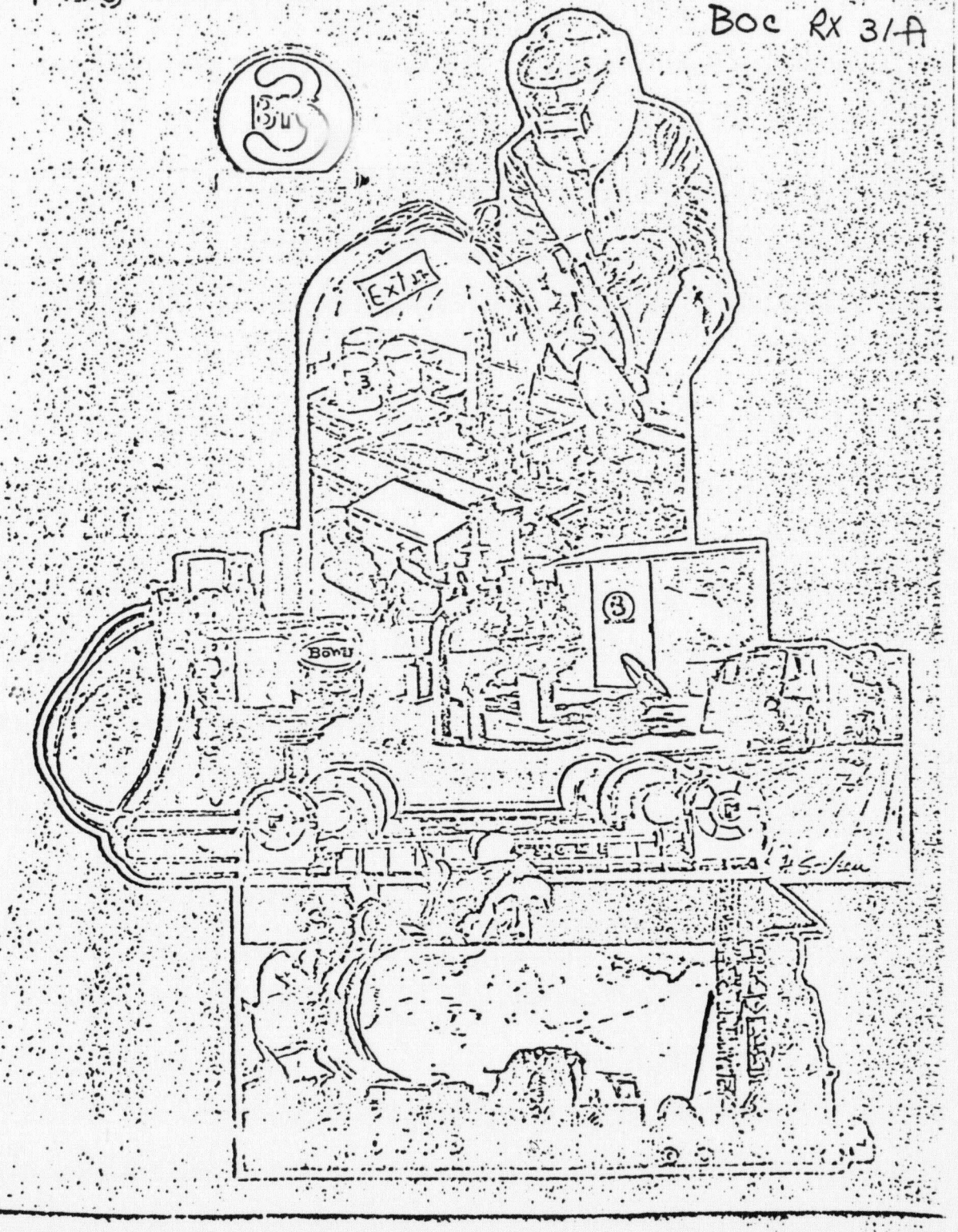
Rx 20

Big Thee Industries Inc, 1973 Progress Report

Boc Rx 31-A



BOC RX31-B

Directors and Officers

Directors

HARRY ALLEN*
Secretary, Big Three Industries, Inc.

ROSS P. BENNETT
Investments

CHARLES H. GLASIER*
Executive Vice President, Big Three Industries, Inc.

WILLIAM IRRGANG
Chairman, The Lincoln Electric Company

ARDON B. JUDD
Investments

JOHN A. McKISSICK
Executive Vice President, Big Three Industries, Inc.

THOMAS E. SANDS*
Treasurer and Assistant Secretary, Big Three Industries, Inc.

THOMAS H. SHARTLE, SR.
Chairman of the Board, Texas Electric Steel Casting Company

DANTE A. SIRACUSA
President of Bowen Tools, Inc., Subsidiary of Big Three Industries, Inc.

ALBERT K. SMITH*
President, Big Three Industries, Inc.

HARRY K. SMITH*
Chairman of the Board and Chief Executive Officer, Big Three Industries, Inc.

RUSSELL K. SMITH
Cost Control Manager, Big Three Industries, Inc.

DONALD E. WALDEN
District Manager, Big Three Industries, Inc.

Officers

HARRY K. SMITH
Chairman of the Board and Chief Executive Officer

ALBERT K. SMITH
President

CHARLES H. GLASIER
Executive Vice President

JOHN A. McKISSICK
Executive Vice President

WILLIAM M. BOREN
Vice President

PAUL H. GALTON
Vice President

WALTER LOEWENSTERN
Vice President

R. O. MOORE
Vice President

HAROLD E. PURDOM
Vice President

H. GLEN WHEAT
Vice President

HARRY ALLEN
Secretary

THOMAS E. SANDS
Treasurer and Assistant Secretary

Transfer Agents

The Chase Manhattan Bank
New York City, New York

Houston Citizens Bank
Houston, Texas

Registrars

The Chase Manhattan Bank
New York City, New York

Texas Commerce Bank
National Association
Houston, Texas

Legal Counsel

Liddell, Sapp, Zivley & Brown
Houston, Texas

*Member of the Executive Committee of the Board of Directors

Big Three is an Equal Opportunity Employer

A 5057

Boc RX 31-C

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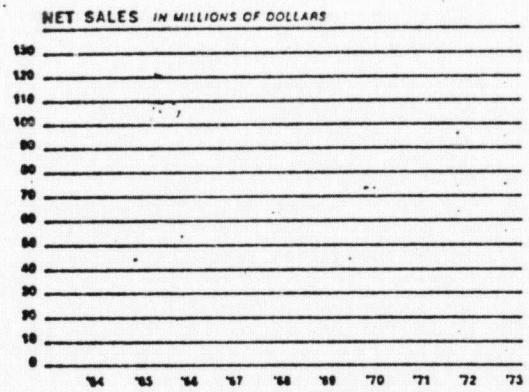

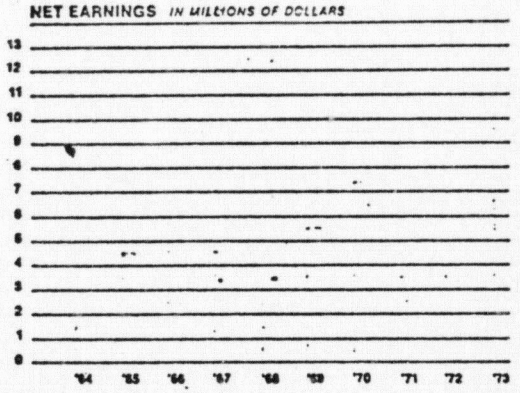

1964 TO 1967 AS PREVIOUSLY REPORTED

Big Three Industries Financial Summary and Highlights

	Year Ended December 31 1973	1972
Net Sales	$ 118,913,000	$ 96,418,000
Net Earnings	13,162,000	10,250,000
Earnings per share of capital stock	2.51	2.06
Total Assets	167,088,000	137,319,000
Book Value Per Share of Capital Stock	19.27	18.25
Net Earnings as a Percent of Equity Investment	13.0	11.3
Average Shares of Capital Stock	5,253,569	4,974,317

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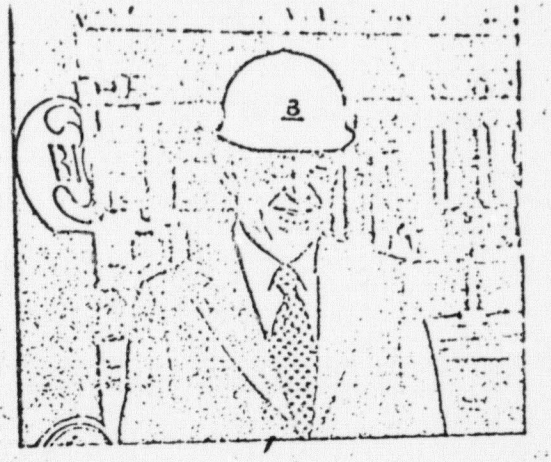

In 1973 our Company achieved another historic milestone. This year saw the company attain sales in excess of $100 million with excellent profit margins. Sales for 1973 totaled $118,913,000 as compared to $96,418,000 in 1972. This represents an increase of 23.3%. Consolidated net earnings for 1973 were $13,162,000, or a 28.4% increase over the $10,250,000 reported in 1972. Profits represent a little over 11% of total sales.

The sales momentum of 1973 is continuing into 1974. Sales for the first two months of 1974 were $22,021,000 as compared to $17,664,000 for the same period in 1973, or an increase of 25%.

For 1973, the investment tax credit is $525,000 as compared to $775,000 in 1972. The investment tax credit in 1974 will be considerably in excess of any previous year.

The Company is composed of three operating groups: The Energy Related Divisions, Industrial Gas Division, and Welding Equipment Divisions. The sales and pre-tax earnings for these divisions which follow the presentation made to the SEC in our annual report Form 10-K below:

Consolidated Net Sales and Pre-Tax Income, before G&A Expenses (including applicable depreciation), Interest Expense, Federal Income Taxes, Minority Interest and Equity in jointly owned companies (in thousands of dollars).

	1973		1972	
	Net Sales	Pre-Tax Income	Net Sales	Pre-Tax Income
Energy Related Divisions	$ 45,868	$14,895	$36,013	$11,185
Industrial Gases	35,545	12,562	30,944	10,508
Welding Equipment Divisions	37,480	3,980	29,461	3,130
Total	$118,913	$31,437	$96,418	$24,824

A 5059

Boc Rx 31-E

The energy divisions represents 39% of the total 1973 sales and 47% of the pre-tax income. Sales for this division are up 27% over 1972 and profits increased 33%. Industrial gases represent 30% of our sales and 40% of the pre-tax income. Sales for 1973 increased 15% over 1972 while profits increased 20%. The welding equipment divisions represents 31% of the 1973 sales and 13% of the pre-tax income. Sales during 1973 increased 27% and profits increased 27%. In the energy divisions are our NOWSCO operations, Bowen Tools and The Dia-Log Company. The industrial gas division handles sales of all gases, thru pipeline, liquid merchant market and cylinders. Our welding equipment divisions comprises welding equipment manufactured by others and our own Ransome and Tempil® divisions.

To meet the growing demand, the capital expenditures in 1973 were the highest in the history of the Company. We spent $25,603,000 in 1973. Capital expenditures for 1974 will be approximately $40,000,000. Most of these expenditures relate to the energy divisions and the industrial gas division in which the return on equity is the highest.

During 1973 NOWSCO opened four new locations in the United States which increased their total stations to 24. Vehicles and related equipment are constantly being increased. A research program inaugurated at NOWSCO shows promising new developments for stimulation of oil and gas wells for which patents have been applied.

NOWSCO of Canada has opened three new locations. Their sales in 1973 were $10,090,000 versus $6,137,000 in 1972, an increase of 64%. Net earnings in 1973 were $1,628,000 as compared with $831,000 in 1972, an increase of 95%. This division is 64% owned by your Company.

Bowen Tools has completed their new manufacturing facilities and other expansions too numerous to cover in this letter have been completed.

During the fourth quarter of 1973, commitments were received from The Dow Chemical Company and Dow Badische Company at Freeport, Texas, for large tonnages of pipeline oxygen and nitrogen on long term take-or-pay contracts. The two pipelines to Dow should be completed in 1974 to insure January 1, 1975 deliveries.

We have purchased three new air separation plants for delivery in 1975 which will be strategically located for our own operations.

Looking back on 1973, it was by far the best year of the Company's 53 year history. The results of the first quarter of 1974 are setting new records. We can see nothing but continued expansion in all divisions for the future. This could not have been done without the loyal performance on the part of our employees whose achievements have helped us obtain our growth.

H K Smith

H. K. SMITH
Chairman of the Board

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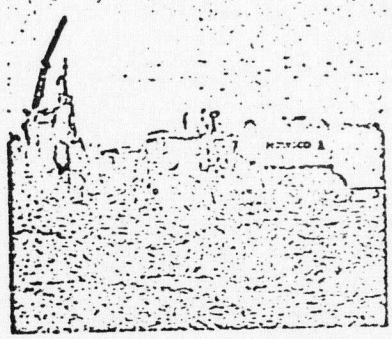
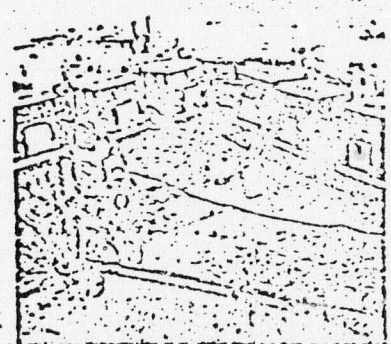
NOWSCO Division



Using high-pressure nitrogen injection, NOWSCO fleet clears unwanted material from well bore to increase production.

As a result of the continued search for energy by the major oil companies as well as the independents, your NOWSCO Division of Big Three Industries, Inc. has once again posted record sales and earnings for 1973.

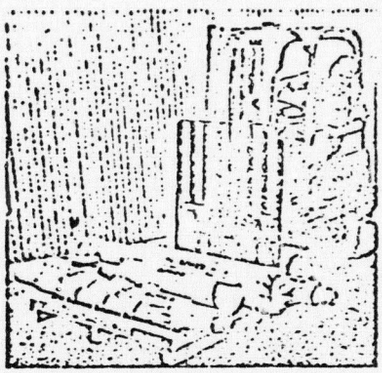
In addition, NOWSCO'S contributions to the energy industry are not confined to the oil fields exclusively. We are also actively engaged in a wide variety of services performed in pipeline, refinery and petrochemical plants, and in the transportation and processing industries. Using nitrogen produced by Big Three Industrial Gas and equipment manufactured by Bowen Tools, Inc., this division has revolutionized many conventional well servicing techniques. Wells that are off production may be restored to producing status in a matter of hours as compared with older methods which require several days to several weeks to complete. Our services are vital and necessary to meet this nation's energy demands and insure our national security. With this in mind, the NOWSCO Division faces the future with optimism and enthusiasm. The capital expenditure program for 1974 is the largest in the history of the company. Four new domestic districts are scheduled to be opened during 1974 in addition to the expansion of our fleet and facilities in areas of current operations. The potential of our services in other geographic areas of international oil and gas operations is also being pursued. The demands for energy in the United States and abroad indicate a continued high level of activity for the industry we serve as well as the services we provide.



"Frac job" is just one important NOWSCO well service for revitalizing producing oil wells.

A 5061

Boc RX 31-E

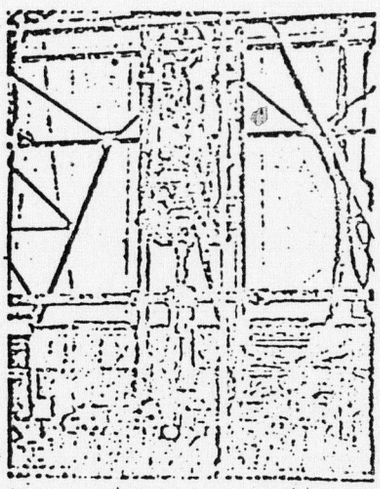


Bowen fishing tools are readied for emergency shipment to the oil fields.

Bowen Tools, Inc. manufactures and markets equipment which is vitally important to the entire petroleum industry—service companies, drilling contractors and oil companies. In addition to building the continuous string units used by NOWSCO, Bowen manufactures power swivels, wireline equipment and fishing tools.

Bowen is best known for its fishing tools which are used throughout the world to retrieve undesirable objects from well holes. These objects can be broken drill bits, drillpipe that has twisted in two, or any other undesirable obstructions. Fishing out an object which is lodged miles deep in a hole is a technical and an important operation. Failure to clear such debris from the hole is very serious because it could necessitate abandonment of the well and consequent loss of production. Bowen tools have an excellent history of success in retrieving operations; indeed, it may be stated that nearly all successful fishing jobs throughout the world are performed with one or more of a large variety of Bowen Fishing Tools.

Bowen—like its sister companies NOWSCO and Dia-Log—plays a vital role in the worldwide effort to obtain optimum recovery of petroleum resources, and thereby to ease the current energy shortage.



Bowen electrical swivel installed on drilling rig for heavy and deep drilling operation.

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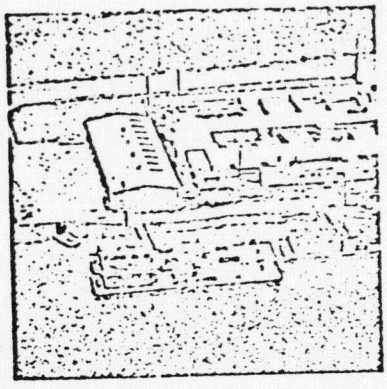
Boc Rx 31-H



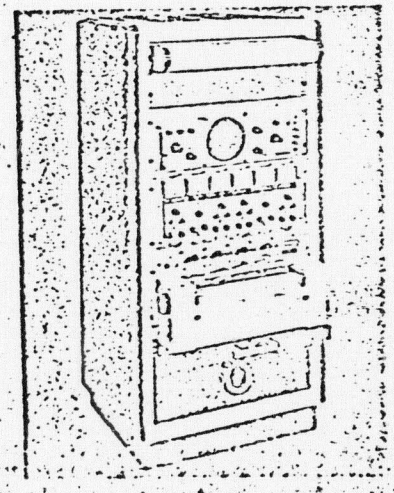
Dia-Log service warehouse provides vital services to the Gulf Coast area oil industry.

Big Three Dia-Log Division performs numerous technical wire line services that are essential to the drilling and producing segments of the petroleum industry.

During drilling of new wells, or in reworking producing wells, the drill stem or tubing often becomes "stuck" or lodged in the well bore. Special Dia-Log electro-mechanical instruments are used to locate the point at which the pipe is stuck. A Dia-Log device is then used to unthread or sever the pipe and recover it. Then a service company using special tools and equipment—which are manufactured predominately by Bowen Tools—frees additional joints of drill stem or tubing. The Dia-Log services are again used to recover the newly freed section of pipe and the procedure is repeated until all stuck pipe is recovered.

Dia-Log also provides complete caliper inspection services for detecting and evaluating the extent of damage to oil well casing and tubing caused by corrosion or wear, thereby preventing loss of well production. Further, during 1970, Dia-Log began expansion into a new field of wire line services commonly referred to as "Cased Hole Logging and Perforating." In this field, Dia-Log provides the instruments, equipment, and skilled personnel necessary to detect oil and gas bearing formations and then perforate the casing opposite these zones so that oil or gas can flow into the well bore.

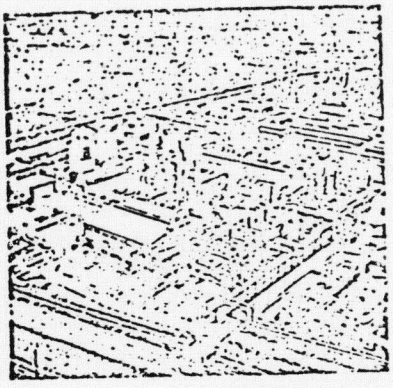
During the current energy shortage, Dia-Log, NOWSCO, and Bowen Tools will be providing services and equipment that will be essential if the petroleum supply is to be increased significantly.



Dia-Log console is typical of sophisticated instrumentation necessary for downhole readings.

A 5063

Boc RX 31 I



Big Three Bayport air-separation plant provides steam and industrial gases.

During 1973 the growth of our industrial gas business continued and the year ended with an overall sales increase of 15%. This was achieved even though the growth of our pipeline gas business slowed in the fourth quarter of 1973. This was due to the shortage of feedstocks for our large pipeline customers, which affected their requirements for industrial gas from Big Three. With the removal of controls early in 1974 this limiting factor of feedstock shortage was removed and our industrial gas business resumed its normal growth.

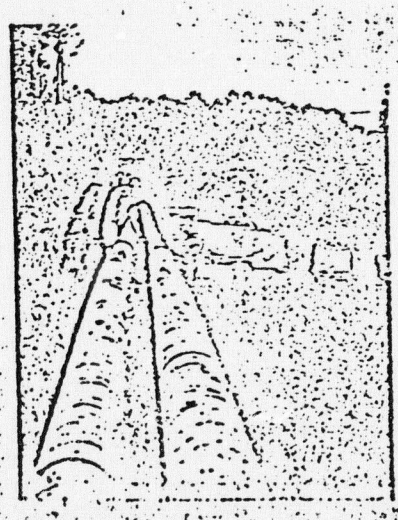
The Industrial Gas Division also saw further expansion of its pipeline system during the year, and with the completion of lines now being built, Big Three will have an oxygen and nitrogen pipeline system extending from Freeport, Texas, to Lake Charles, Louisiana. This is the most extensive industrial gas pipeline system in the United States.

While much concern was expressed in some quarters for the supply of natural gas to our Bayport facility during 1973, at no time did we experience a shortage of natural gas, nor is any anticipated in the foreseeable future.

The Industrial Gas Division continued to explore new applications for its products during 1973. In this direction the use of oxygen in cement kilns to increase production has been very successful, and we are now supplying several locations with liquid oxygen on a regular basis. It is anticipated that these applications could eventually lead to on-site plants or pipeline installations.

In addition to the growth of our pipeline business, sales in the liquid merchant market were exceedingly strong. For example, sale of liquid oxygen and liquid argon increased over 30% during this year.

With additional contracts already signed, which will go into effect in 1974, the outlook for the continued growth for the industrial gas business is very bright.



Pipeline is part of expansion of Big Three network for transportation of industrial gases.

A 5064

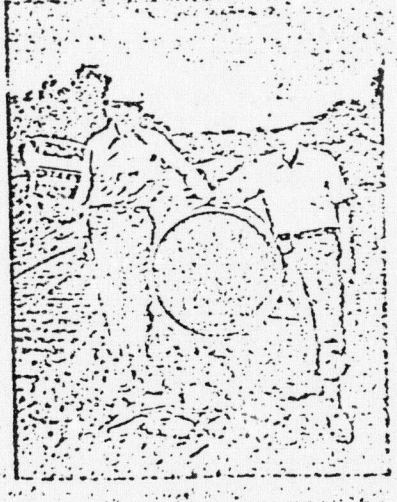
BOC RX 31J

Big Three's Automatic Innershield Pipeline Welding System proved itself on 21-mile project in tough Oklahoma terrain.

Last year, we reported that the Big Three Automatic Innershield Pipeline Welding System would soon undergo its first full-scale field test. Last spring, the system was used on a 21-mile pipeline project in Oklahoma. The results of the 5 years of developmental work by Big Three and Lincoln Electric Company of Cleveland, Ohio, were very gratifying. The system performed as expected, and the project was well covered by the industry media, particularly by the *Oil & Gas Journal* and *Pipeline Industry* magazines.

As expected, the Big Three system was capable of welding in all positions in rugged terrain, produced consistently high-quality welds in varying weather conditions, and proved its portability and ruggedness. The system effects a great savings, both in time and expense, in the construction of small to very large diameter pipelines.

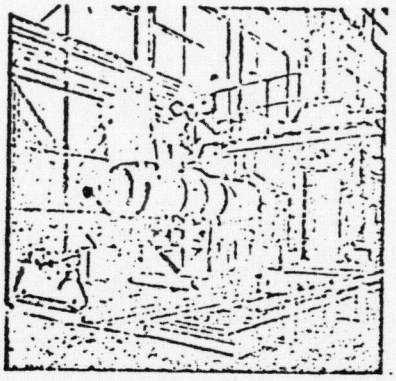
Since pipelines represent the most economical and efficient method of transporting energy, the Big Three Automatic Innershield system is expected to play an important part in meeting near and long term energy needs.



Harry K. Smith, Chairman of the Board, Big Three Industries, Inc. and William Irrgang, Chairman, The Lincoln Electric Company, inspect pipeline in Oklahoma.

A 5065

Boc RX 3+K



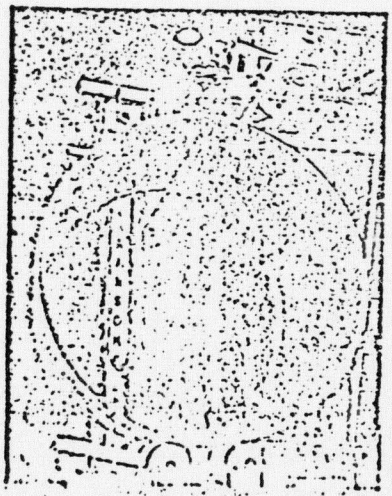
Intricate welding fabrication makes use of Ransome turning rolls, manipulator and positioner.

Ransome manufactures precision machinery and equipment for the welding fabrication industry. The company is the pioneer and leading supplier of welding manipulators, positioners and turning rolls, all of which are in general use throughout industry. Rugged construction, dependable operation, 40 years of engineering expertise, and long service life of Ransome equipment is notable, and accounts for another year of unprecedented growth.

In particular, Ransome equipment is in great demand in areas where efficient energy generation and storage are of primary concern. For the electric power generation industry, Ransome positioning equipment contributes to effective welding, fabricating and testing of both fossil fuel and nuclear power plant apparatus. Major companies rely on Ransome equipment for automatic welding of boilers, nuclear reactors, turbine generators, heat exchangers and condensers. At the utility level, Ransome turning rolls are used to service and inspect turbine rotors.

All the various segments of the energy industry represent a tremendous market for Ransome products, and Ransome products are meeting the needs of this vital industry.

Big Three's Tempil® Division provides industry with a broad line of temperature sensitive markers, labels, paints and coatings. These materials facilitate visual monitoring of operating temperatures and have proven valuable in reducing heat waste (i.e. energy waste) and in preventing overloading of power transformers and other generating equipment. Heat control is also vital in the precision welding and cladding of nuclear reactors, heavy wall boilers, heat exchangers and steam turbines.



Ransome turning rolls and Lincoln welding equipment facilitate fabrication of large vessels.

A 5066

Boc RX 31-L

Rig-Thico Industries, Inc. and Subsidiaries

Assets

	December 31 1973	1972
Current Assets		
Cash and certificates of deposit	$ 11,119,000	$ 5,016,000
Notes and accounts receivable less allowances of $238,000 in 1973 and $129,000 in 1972—Note C	19,381,000	14,736,000
Inventories—Note A	16,523,000	14,317,000
Prepaid expenses and other current assets	720,000	706,000
Total Current Assets	47,743,000	34,805,000
Investments and Other Assets		
Investments in jointly-owned company—Note A	1,128,000	904,000
Cash value of officers' life insurance	805,000	745,000
Other assets, principally non-current receivables	421,000	360,000
	2,354,000	2,009,000
Property, Plant, and Equipment—Note A		
Land	4,955,000	3,130,000
Buildings and improvements	19,907,000	18,346,000
Machinery and equipment	149,609,000	137,851,000
Construction in progress—Note H	11,283,000	1,238,000
	185,754,000	160,565,000
Less accumulated depreciation	69,494,000	61,043,000
	116,260,000	99,522,000
Deferred Charges and Intangibles—Note A	731,000	983,000
	$ 167,088,000	$ 137,319,000

See Notes to Consolidated Financial Statements

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Boc Rx 31-M

Big Three Industries, Inc. and Subsidiaries

Liabilities

	December 31 1973	1972
Current Liabilities		
Trade payables and accrued expenses	$ 9,045,000	$ 6,501,000
Construction accounts payable	3,027,000	550,000
Notes payable	388,000	—
Dividends payable	834,000	723,000
Federal income taxes—Notes A and F	3,175,000	1,096,000
Current maturities of long-term debt	4,033,000	3,696,000
Total Current Liabilities	20,502,000	12,566,000
Long-Term Debt—Note D	31,974,000	24,361,000
Deferred Federal Income Taxes—Note A	10,544,000	7,333,000
Minority Interest in Consolidated Subsidiaries	2,851,000	1,766,000

Stockholders' Equity

Capital Stock, par value $2.50 per share—Note E	13,138,000	12,867,000
Paid-In Capital	44,315,000	39,878,000
Retained Earnings—Note D	43,764,000	38,043,000
	101,217,000	90,788,000
Commitments—Note H		
	$ 167,083,000	$ 137,319,000

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BOC BX 31-N

Big Three Industries, Inc. and Subsidiaries

Statement of Consolidated Earnings

	Years Ended December 31	
	1973	1972
Net Sales	$ 118,913,000	$ 96,418,000
Other income, principally interest	1,146,000	646,000
	120,059,000	97,064,000
Costs and expenses:		
Cost of products sold	61,115,000	49,237,000
Selling and distribution	17,670,000	14,063,000
Depreciation and amortization—Note A	9,629,000	9,273,000
General and administrative expenses	5,692,000	4,813,000
Interest	2,293,000	2,306,000
	96,399,000	79,697,000
Earnings before taxes	23,660,000	17,367,000
Provision for federal income taxes—Notes A and F:		
Current	7,417,000	4,534,000
Deferred	2,698,000	2,463,000
	10,115,000	6,997,000
	13,545,000	10,370,000
Minority interest in consolidated subsidiaries net earnings	(605,000)	(247,000)
	12,940,000	10,123,000
Equity in undistributed net earnings of jointly-owned company—Note A	222,000	127,000
Net Earnings	$ 13,162,000	$ 10,250,000
Earnings per share—Note A	$ 2.51	$ 2.00

( ) Denotes Deduction
See Notes to Consolidated Financial Statements

A 5069

Boc Rx 31-0

Big Three Industries, Inc. and Subsidiaries

Statement of Consolidated Changes in Financial Position

	Years Ended December 31	
	1973	1972
Funds Provided		
Net earnings for the year	$ 13,162,000	$ 10,250,000
Add charges (credits) not requiring current outlay of funds:		
Depreciation and amortization	9,629,000	9,273,000
Deferred income taxes	2,698,000	2,463,000
Minority interest in consolidated subsidiaries	605,000	247,000
Equity in undistributed net earnings of jointly-owned company	(222,000)	(127,000)
Total from operations	25,872,000	22,106,000
Increase in long-term debt less portion representing refinancing of $19,757,000	10,000,000	—
Exercise of stock options	214,000	1,070,000
Contributions to capital made by minority stockholders of consolidated subsidiaries	480,000	245,000
Value of Capital Stock issued in purchase transactions	—	50,000
Issuance of Capital Stock in conversion of debentures	—	24,990,000
Decrease in deferred charges and other assets	55,000	378,000
Proceeds of stock issued by a consolidated subsidiary	—	1,598,000
Total funds provided	36,621,000	50,437,000
Funds Used		
Additions to property, plant and equipment (net)	26,285,000	10,093,000
Reduction in long-term debt	2,387,000	3,846,000
Reduction of debentures	—	25,000,000
Cash dividends paid by:		
Big Three	2,947,000	2,565,000
Pooled business prior to acquisition	—	32,000
Total funds used	31,619,000	41,536,000
Increase in working capital	$ 5,002,000	$ 8,901,000
Changes in Components of Working Capital		
Increase (decrease) in current assets:		
Cash	$ 6,103,000	$ 2,866,000
Notes and accounts receivable	4,645,000	3,041,000
Inventories	2,176,000	1,944,000
Prepaid expenses	14,000	102,000
	12,938,000	7,973,000
Increase (decrease) in current liabilities:		
Accounts payable and accrued expenses	5,021,000	(133,000)
Notes payable	388,000	(1,406,000)
Dividends payable	111,000	176,000
Federal income taxes	2,079,000	1,035,000
Current portion of long-term debt	337,000	(600,000)
	7,936,000	(928,000)
Increase in working capital	$ 5,002,000	$ 8,901,000

( ) Denotes Deduction

See Notes to Consolidated Financial Statements

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Boc Rx 31-P

Big Three Industries, Inc. and Subsidiaries

	Capital Stock	Paid-In Capital	Retained Earnings
Balance at January 1, 1972	$ 10,858,000	$ 10,644,000	$ 35,547,000
Net earnings	—	—	10,250,000
Cash dividends paid by:			
Big Three	—	—	(2,565,000)
Pooled business prior to acquisition	—	—	(32,000)
Conversion of debentures, net of deferred debt issuance and other expenses (664,658 shares)	1,662,000	22,691,000	—
Increase in equity of a subsidiary arising from issuance of stock in excess of book value	—	613,000	—
Purchase of partnership's assets (1,000 shares)	3,000	47,000	—
Exercise of stock options (38,156 shares)	95,000	975,000	—
2% stock dividend effected December 15, 1972 (99,709 shares)	249,000	4,908,000	(5,157,000)
Balance at December 31, 1972	12,867,000	39,878,000	38,043,000
Net earnings	—	—	13,162,000
Cash dividends paid by Big Three	—	—	(2,947,000)
Exercise of stock options (6,441 shares)	16,000	198,000	—
2% stock dividend effected December 14, 1973 (101,864 shares)	255,000	4,239,000	(4,494,000)
Balance at December 31, 1973	$ 13,133,000	$ 44,315,000	$ 43,764,000

( ) Denotes deductions
See Notes to Consolidated Financial Statements

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Boc RX 31-0

Big Three Industries, Inc. and Subsidiaries

Notes to Consolidated Financial Statements

Years ended December 31, 1973 and December 31, 1972

NOTE A—Accounting Policies

The accounting principles followed by Big Three Industries, Inc. (Big Three) and its subsidiaries and the methods of applying these principles which materially affect the determination of financial position, changes in financial position, or results of operations are summarized below.

Consolidation. The consolidated financial statements include the accounts of Big Three and its domestic and foreign subsidiaries. Investment in a jointly-owned company is accounted for by the equity method. All significant intercompany accounts and transactions have been eliminated in preparing the consolidated financial statements. Foreign subsidiaries represent 7% and 5% of consolidated assets at December 31, 1973, and 1972 respectively. The operations of foreign subsidiaries represent 10% and 7% of consolidated sales, and 9% and 6% of consolidated net earnings for the years ended December 31, 1973, and 1972 respectively.

The financial statements of foreign subsidiaries have been translated into United States dollar equivalents generally using the current/non-current method. Current assets and current liabilities are translated at the rate of exchange in effect at the close of the year. Other assets and liabilities are translated at the rates in effect at the dates these assets were acquired or liabilities were incurred. Income and expense accounts are translated generally at the average rate in effect during the year. Translation gains or losses, which are not significant, are credited or charged to income in the year in which they originate.

Inventories. Inventories consisting primarily of finished goods are carried at the lower of cost or market. Cost is generally determined on a first-in, first-out method and market is considered as replacement value.

Property, Plant and Equipment. Property, plant and equipment are stated at cost. The provision for depreciation is computed principally using the straight-line method at rates considered sufficient to amortize the cost over the estimated useful lives (buildings and improvements—10 to 40 years; machinery and equipment—10 to 16 years; transportation equipment—4 to 8 years; rental equipment —6 years; furniture and fixtures—10 years). Normal repairs and maintenance costs are charged to expense when incurred. Betterments and major renewals are capitalized and amortized over the estimated remaining useful life of the asset. Gains or losses on disposals of property or equipment are included in the statement of consolidated earnings.

Deferred Charges and Intangible Assets. Deferred charges and intangible assets are carried at cost less amortization. The provision for amortization is computed principally using the straight-line method based on the estimated period of benefit to Big Three.

Federal Income Taxes. For federal income tax purposes, depreciation is computed principally using an accelerated method. Reductions in current federal income taxes arising from the excess of depreciation claimed for federal income tax purposes over that included in the consolidated financial statements have been charged against consolidated earnings and added to deferred federal income taxes on the consolidated balance sheet. Investment tax credits are accounted for by the flow-through method and amounted to [illegible]5,000 in 1973 and $775,000 in 1972.

Because Big Three plans to finance expansion and operating requirements of its foreign subsidiaries and jointly-owned company by reinvestment of its share of their undistributed net earnings, deferred income taxes have not been provided on such earnings. In addition, Big Three has a Domestic International Sales Corporation (DISC) which receives certain tax benefits and special tax treatment under provisions of the Revenue Act of 1971. Undistributed earnings on which federal income taxes have not been provided and the untaxed portion of the DISC's income amounted to $7,220,000 at December 31, 1973, and $4,101,000 at December 31, 1972.

Stock Options. Amounts received upon the exercise of options are added to capital stock and paid-in capital. Options are granted at not less than fair market at the date of grant and accordingly no charges are made to earnings as a result of the granting or exercising of options.

Pension Plans. Pension costs are computed by the entry age normal method and include amortization of prior service costs over a 30 to 40 year period. Pension costs are funded as accrued.

Earnings Per Share. Earnings per share is based on the average outstanding shares of Capital Stock retroactively adjusted for 2% stock dividends effected in 1973 and 1972. Fully diluted earnings per share is not presented since the assumed exercise of stock options results in dilution of less than 3%.

BOC RX 31-R

Outstanding at December 31, 1972	28,870	26.90 to 46.04	1,186,216	50.20	1,449,274
Granted	29,172	33.46 to 46.08	1,040,457	33.46 to 46.08	1,040,457
Exercised	(6,608)	26.90 to 46.04	(213,020)	46.44 to 53.09	(337,164)
Outstanding at December 31, 1973	51,434	33.46 to $46.08	$ 2,013,053	$48.53	$ 2,496,092
Options which became exercisable:					
1972	13,005	$26.90 to 29.99	$ 357,116	$38.91	$ 506,025
1973	19,032	$46.04	$ 876,233	$53.09	$ 1,021,038

NOWSCO Well Services, Ltd., a 64% owned subsidiary, has an incentive stock option plan with provisions similar to those of Big Three's Plan. At December 31, 1973, 54,800 shares of their common stock were reserved for granting of options, and options to purchase 2,500 shares were granted during 1973.

NOTE F—Federal Income Taxes

The Internal Revenue Service has recently completed an examination of Big Three's consolidated income tax returns for the years ended December 31, 1970 and 1971. Adjustments have been proposed to disallow certain investment tax credits which, if sustained, would increase federal income taxes for these years by $628,000. Big Three is protesting these adjustments and believes that the ultimate settlement of these examinations will not materially affect the consolidated financial statements.

NOTE G—Pension Plans

Big Three and its subsidiaries have pension plans covering substantially all of their employees. Pension expense was $355,000 in 1973 and $285,000 in 1972. The actuarially computed value of vested benefits, as estimated by consulting actuaries, exceeded the value of the pension plan assets by $689,000 at the latest valuation date (January 1, 1973). The actuarially computed value of unfunded past service cost was estimated to be $2,763,000 at the latest valuation date (January 1, 1973).

NOTE H—Commitments

Consolidated rent expense (which is less than one percent of consolidated revenues) and future lease commitments are not considered to be material. The present value of non-capitalized financing leases is not material. Likewise the impact on consolidated net earnings if such leases had been capitalized would not be material.

Estimated costs to complete construction projects in process at December 31, 1973, was $17,179,000. It is anticipated that these projects will be completed during 1974 and will be funded from current operations.

Report of Independent Accountants

Board of Directors
Big Three Industries, Inc.

We have examined the consolidated financial statements of Big Three Industries, Inc. and subsidiaries for the years ended December 31, 1973, and December 31, 1972. Our examinations were made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We did not examine the consolidated financial statements of NOWSCO Well Service, Ltd., a consolidated subsidiary, which statements reflect total assets and revenues constituting 6% and 8% in 1973 and 4% and 6% in 1972, respectively, of the related consolidated totals. These statements were examined by other auditors whose reports thereon have been furnished to us and our opinion expressed herein, insofar as it relates to the amounts included for NOWSCO Well Service, Ltd., is based solely on the reports of other auditors.

In our opinion, based upon our examinations and the reports of other auditors, the accompanying consolidated balance sheets and statements of consolidated earnings, stockholders' equity and changes in financial position present fairly the consolidated financial position of Big Three Industries, Inc. and subsidiaries at December 31, 1973, and December 31, 1972, and the consolidated results of their operations, changes in stockholders' equity and changes in financial position for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Houston, Texas
March 12, 1974

Ernst & Ernst

Boc Rx 31-5

NOTE B—Acquisitions

In August, 1972, Big Three acquired The Dia-Log Company by issuance of 140,586 shares of Capital Stock in a transaction accounted for as a pooling of interest. The consolidated financial statements have been restated to include the results of operations of The Dia-Log Company for periods prior to acquisition. As of the date of acquisition, The Dia-Log Company had 1972 net sales of $3,813,000 and net earnings of $336,000. In addition, Big Three acquired certain assets of an affiliate of The Dia-Log Company by issuance of 1,040 shares of its Capital Stock.

During 1972, NOWSCO Well Service, Ltd., consumated a public offering of 250,000 shares of its previously unissued common stock which reduced the Big Three ownership and voting interest to approximately 64%. The proceeds from this offering of approximately $1,600,000 were used to acquire additional equipment and retire existing bank debt.

NOTE C—Government Contract Claim

Included in accounts receivable are claims against the United States Government of $1,322,000 at December 31, 1973, and $1,100,000 at December 31, 1972, arising from the partial termination for the convenience of the government, of a multi-year contract to supply nitrogen gases. These claims are based on a recovery of all allowable costs and are approximately equal to the difference between actual deliveries and the minimum deliveries specified in the contract. During 1973 the first of such claims was settled by the Armed Services Board of Contract Appeals in an amount ($162,000) approximately equal to that claimed by Big Three. Collection of this amount is anticipated during 1974. The remaining claims are anticipated to be settled on a similar basis.

NOTE D—Long-Term and Subordinated Debt

Long-Term debt consists of the following:

	December 31	
	1973	1972
7.35% note payable to an insurance company, due in annual installments of $1,583,000 with final payment due July 15, 1988	$ 20,757,000	$ —
8½% note payable to an insurance company, due in annual installments of $1,646,000 with final payment due September 30, 1984 (refinanced in 1973)	—	19,757,000
Note payable to a bank at ½% above the prime interest rate due in quarterly installments of $500,000	6,000,000	8,000,000
Notes payable to individuals arising from the purchase of patents, last payment due June 16, 1978	250,000	300,000
	36,007,000	28,057,000
Less amount due within one year, classified as a current liability	4,033,000	5,006,000
	$ 31,974,000	$ 23,051,000

The notes payable to the insurance company and bank were made under terms of loan agreements which impose various conditions and restrictions on Big Three including the maintenance of minimum consolidated working capital of $12,000,000, limitations on the payment of dividends and on the amount of indebtedness, guarantees and rentals under leases. Consolidated retained earnings available for payment of cash dividends under terms of the most restrictive of these agreements as of December 31, 1973 was $7,803,000.

The annual principal payments required on long-term debt during the five years ending December 31, 1978, are as follows: 1974 through 1976—$4,033,000 per year; 1977 and 1978—$2,033,000 per year.

On April 21, 1972, Big Three called for the redemption of its $25,000,000 of 5¾% Convertible Subordinated Debentures. Prior to the redemption date, $24,990,000 of these debentures were converted into 691,510 shares of Big Three Capital Stock. The remaining $10,000 of debentures were redeemed.

NOTE E—Captial Stock

The authorized number of shares of Capital Stock was 15,000,000 at December 31, 1973, and 10,000,000 at December 31, 1972. The number of shares issued and outstanding was 5,255,223 at December 31, 1973, and 5,249,856 at December 31, 1972.

Information included in the consolidated financial statements (except for the Statement of Consolidated Stockholders' Equity) and notes to consolidated financial statements as to shares issued and outstanding; shares issuable upon granting or exercising of stock options; and per share results have been adjusted retroactively for the 2% stock dividends effected in December, 1973, and December, 1972.

Under Big Three's qualified stock option plan, 81,983 shares of Capital Stock have been reserved for granting of options. Options are granted at not less than the fair market value of the shares at the date options are granted and generally become exercisable one year from the date of grant and expire five years from the date of grant. Shares available for future grants were 30,549 at December 31, 1973, and 59,721 at December 31, 1972.

Additional information is summarized as follows:

	Number of Shares	Option Price Per Share	Option Price Total	Fair Market Value Per Share	Fair Market Value Total
Outstanding at January 1, 1972	51,485	$26.90 to $34.34	$ 1,432,823	$33.15	$ 2,015,627
Granted	19,032	46.04	876,233	46.04	876,233
Cancelled	(1,951)	26.90	(52,482)	38.80	(75,639)
Exercised	(39,697)	26.90 to 28.83	(1,070,358)	38.94 to 46.07	(1,791,781)

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BOC Rx 31-T

Offices and Plants of Big Three Industries, Inc., and Subsidiaries

Big Three Industries, Inc.
Southern Division Offices
Harold E. Purdom, Manager
Southern District

Albuquerque, New Mexico
Austin, Texas
Bayport, Texas
Beaumont, Texas
Brownsville, Texas
Corpus Christi, Texas
Honolulu, Hawaii
Houston, Texas
Long Beach, California
Miami, Florida
Odessa, Texas
San Antonio, Texas

Big Three Industries, Inc.
Northern Division Offices
John A. McKissick, Manager
Northern District

Borger, Texas
Dallas, Texas
El Paso, Texas
Fort Worth, Texas
Garland, Texas
Longview, Texas
Lubbock, Texas
Oklahoma City, Oklahoma
Tulsa, Oklahoma

Big Three Industries, Inc.
Plants
Baton Rouge, Louisiana
Bay City, Texas
Bayport, Texas
Beaumont, Texas
Houston, Texas
Hurst, Texas
Ingleside, Texas
Lake Charles, Louisiana
Merritt Island, Florida
Santa Susana, California
Victoria, Texas
West Palm Beach, Florida

Big Three Lincoln (U.K.) Limited
Donald J. Middlehurst, Manager

Glasgow, Scotland
Invergordon, Scotland

Woodward Wight Big Three, Inc.
C. C. Hodges, President

Baton Rouge, Louisiana
Jackson, Mississippi
Lafayette, Louisiana
Lake Charles, Louisiana
Morgan City, Louisiana
New Orleans, Louisiana

Bowen Tools, Inc.
Dante A. Siracusa, President

Plant
Houston, Texas

Sales Offices and Warehouses
Bossier City, Louisiana
Casper, Wyoming
Clarksburg, West Virginia
Corpus Christi, Texas
Edmonton, Alberta, Canada
Farmington, New Mexico
Hobbs, New Mexico
Houma, Louisiana
Houston, Texas
Laurel, Mississippi
Long Beach, California
New Iberia, Louisiana
Odessa, Texas
Oklahoma City, Oklahoma
Perryton, Texas
Williston, North Dakota
Venice, Louisiana
Vernal, Utah

Ransome Division
Paul H. Gallon, Manager
Houston, Texas

Sanstorm Manufacturing Division
Carroll Kendrick, Manager
Houston, Texas

Tempil® Division
Alfred Fleury, General Manager

South Plainfield, New Jersey

Nitrogen Oil Well Service Company (NOWSCO)
Ray Plummer, General Manager

Bakersfield, California
Carlsbad, New Mexico
Casper, Wyoming
Corpus Christi, Texas
Denver, Colorado
Enid, Oklahoma
Flomaton, Alabama
Harvey, Louisiana
Houston, Texas
Lafayette, Louisiana
Laurel, Mississippi
Long Beach, California
Longview, Texas
Maplewood, Louisiana
Monroe, Louisiana
Odessa, Texas
Oklahoma City, Oklahoma
Pampa, Texas
Sonora, Texas
Ventura, California
Vernal, Utah
Victoria, Texas
Woodland, California
Wooster, Ohio

NOWSCO Well Service Ltd.
S. P. Shouldice, President

Brooks, Alberta, Canada
Calgary, Alberta, Canada
Drayton Valley, Alberta, Canada
Edmonton, Alberta, Canada
Estevan, Saskatchewan, Canada
Fort St. John, British Columbia, Canada
Kindersley, Saskatchewan, Canada
Lac La Biche, Alberta, Canada
Medicine Hat, Alberta, Canada
Red Deer, Alberta, Canada
Swift Current, Saskatchewan, Canada
Whitecourt, Alberta, Canada
Zama, Alberta, Canada

BOC-NOWSCO
Great Yarmouth, England
London, England

The Dia-Log Company
Harley Latson, President

Beaumont, Texas
Casper, Wyoming
Corpus Christi, Texas
El Dorado, Arkansas
Great Bend, Kansas
Healdton, Oklahoma
Hobbs, New Mexico
Houma, Louisiana
Houston, Texas
Kenai, Alaska
Kilgore, Texas
Lake Charles, Louisiana
Laurel, Mississippi
Liberal, Kansas
Natchez, Mississippi
New Iberia, Louisiana
Odessa, Texas
Oklahoma City, Oklahoma
Snyder, Texas
Sonora, Texas
Taft, California
Venice, Louisiana
Ventura, California
Vernal, Utah
Victoria, Texas
Whittier, California
Williston, North Dakota

NOWSCO Venezolana
Cecil Strube, Manager
Anaco, Venezuela

Big Three Industries, Inc.
3602 West Eleventh
Houston, Texas 77008

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MAY 2 8 1973

Burdett Oxygen Co.

of Cleveland, Inc.

MAY 05 1973

Annual Report for the Year Ended February 28, 1973

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Boc RX 35B

Highlights

Period Ended February 28/29	Fourth Quarter		Fiscal Year	
	1973	1972	1973	1972
Sales and Revenues	$ 6,083,000	$ 4,940,000	$21,950,000	$18,602,000
Income (Loss) Before Taxes and Extraordinary Item	226,000	(120,000)	262,000	(536,000)
Provision For Income Taxes	124,000	—	137,000	—
Income (Loss) Before Extraordinary Item	102,000	(120,000)	125,000	(536,000)
Tax Benefit from Use of Operating Loss Carryforward	105,000	—	119,000	—
Net Income (Loss)	207,000	(120,000)	244,000	(536,000)
Per Common and Common Equivalent Share:				
Income (Loss) Before Extraordinary Item	.08	(.14)	.11	(.62)
Extraordinary Item	.08	—	.11	—
Net Income (Loss)	.16	(.14)	.22	(.62)
Average Common and Common Equivalent Shares	1,341,634 shs	860,525 shs	1,341,634 shs	860,525 shs
Depreciation and Amortization Charged Against Income	$ 343,000	$ 369,000	1,415,000	$ 1,456,000
Working Capital Generated from Operations	445,000	249,000	1,500,000	920,000
Shareholders' Equity	4,055,000	3,260,000	4,055,000	3,260,000
Per Share	4.06	3.79	4.06	3.79

DISCLOSURE®

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BOC RX 35 c

Report to Shareholders

Fiscal 1973 was a year of progress. Operations returned to a profitable level for the first time in four years and revenues rose to an all-time high. Our fourth quarter was especially strong with net income and revenues at the highest level of any quarter in our history. Equally important, our over-all financial position has improved considerably.

Total revenues for the fiscal year ended February 28, 1973, amounted to $21,950,000, up 18 per cent over the $18,602,000 of fiscal 1972. Fiscal 1973 net income amounted to $244,000 or 22 cents per share on the average of 1,341,634 common and common equivalent shares outstanding, which included $119,000 or 11 cents per share from realization of an operating loss carryforward. In fiscal 1972, we lost $536,000 or 62 cents per share on an average of 860,525 shares outstanding.

S. Michael Loveman
President and Chief Executive Officer

The move toward profitability was marked by steady quarter-to-quarter improvement with losses reduced substantially in the first and second periods and the third quarter producing net income of $125,000 or ten cents per share on revenues of $5,439,000. In the fourth quarter, we earned $208,000 or 16 cents per share, including the carryforward amounting to $106,000 or eight cents per share, on revenues of $6,083,000.

The improved bottom line results of fiscal 1973 reflect the increase in total revenues, continued application of the stringent cost control policies put into effect in fiscal 1972 and measures designed to increase emphasis on sales with higher margins.

The $3,348,000 gain in total revenues during fiscal 1973, the largest dollar increase in our history, reflects a number of favorable influences. Included were new applications for our products, more effective marketing as well as a very definite upturn in the industrial sector particularly noticeable to us among our metalworking customers.

We were successful in containing costs during fiscal 1973. Though we expanded our marketing organization, selling and general administrative expenses were up only five per cent over those of the preceding year and as a percentage of sales and revenues were 17.6 per cent compared to 19.8 in fiscal 1972.

Ours is a high fixed cost business and as such the reduction or containment of operating expenses while revenues are being increased can be significant. As an illustration, total revenues in fiscal 1973 were $4,567,000 greater than two years ago. Our fiscal 1973 income before tax considerations and extraordinary items represents a swing of $1,937,000 from the operating loss of fiscal 1971. Operating

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efficiencies accounted for a substantial portion of this improvement which amounted to 42 cents in operating profit for every additional dollar of revenues.

Interest expenses in the year ended February 28 amounted to $1,234,000, down from the $1,344,000 of fiscal 1972. The reduction was achieved in part by the repayment, almost six months in advance, of the $1,000,000 bank loan outstanding as part of our April, 1971 refinancing.

A factor contributing to our ability to repay the bank loan in advance of its due date was the improvement in our cash position made possible by a reduction in receivables. During the course of the year, receivables were reduced by $610,000 even with the substantial increase in sales. This was achieved by implementation of better billing procedures and improved credit policies and practices.

Financial Improvements

At fiscal year-end, we had no bank debt. Cash and equivalents amounted to $1,249,000 compared to $1,043,000 at the end of fiscal 1972 and $290,000 at fiscal 1971 year-end. Working capital at fiscal 1973 year-end totaled $4,040,000, down slightly from the $4,266,000 at the end of the preceding year reflecting the transfer from non-current liabilities to current liabilities the bank loan which has been repaid as well as payment or transfer of other obligations which became current.

Current assets at year-end amounting to $7,491,000 were 2.2 times current liabilities which totaled $3,451,000. Shareholders' equity rose to $4,055,000, or $4.06 a share, from the $3,260,000 or $3.79 a share at fiscal 1972 year-end and retained earnings totaled $1,854,000, up from the $1,640,000 of fiscal 1972.

The average common and common equivalent shares outstanding for fiscal 1973 reflect current accounting practices designed to allow for the actual or potential dilutive effect of the conversion of warrants, options and other instruments into common stock. It includes stock purchase rights granted to the holders of the convertible subordinated debentures sold in April, 1966, but not conversion rights for such debentures because they are not currently dilutive; 300,000 warrants held by The Prudential Insurance Company of America in connection with Prudential's April, 1971 purchase of a $10,000,000 note, the proceeds of which were used to retire other indebtedness and to help complete financing of the plant expansion program; 100,000 warrants held by individuals who loaned $500,000 to Burdett in April, 1971; shares related to script and a promissory note issued to Northern Petrochemical Company, a major pipeline customer; as well as shares made available under the company's stock option plans.

The script and note issued to Northern Petrochemical is in accordance with a March, 1971 agreement under which Northern Petrochemical advanced cash to Burdett based on defined operating losses and released claims against the company. As of February 28, 1973, $508,000 of script and $43,000 of the $130,000 note had been exchanged for 126,634 shares which are included in common shares outstanding.

In October, we obtained a $1,000,000 leasing line of credit, $450,000 of which has been utilized for acquisition of liquid gas storage tanks and cylinders, and diesel tractors. Our plans call for obtaining additional tractors during the current year as part of the program to modernize our transport fleet and reduce maintenance expenses.

The Outlook

Fiscal 1973 results serve as a good indication that progress is being made. While we believe that we have turned the corner we continue to face challenges. We have a large interest burden and while we have been very successful in containing expenses the last two years, inflation continues to exert strong pressures.

Insofar as the fiscal year 1974 is concerned, we are off to a good start with revenues in March and April up over 20 per cent over the excellent performance of the like months last year.

On a longer term basis, there are favorable indications we believe, that demand for gas products has caught up with supply and the

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problem of over-capacity of the industry has abated for the present.

As we all know, our company has had a series of monumental problems ranging from the late and incomplete delivery of our largest production facility to the need for a major refinancing at a time when money costs were steadily rising. I believe, however, that we have come through this period of adversity in many ways stronger than ever. Entrenched, traditional ways of doing business were challenged, and as a result many were altered. Our management organization was realigned, a move which played no small role in the improved efficiencies which began to appear in fiscal 1972.

Somewhat intangible, but very important, is the difference in management emphasis today and two years ago. Then, pressing day-to-day problems necessarily demanded a substantial amount of management time. Now, however, we are able to address ourselves to sound long-term planning and once again can look to new products and applications for future sales.

We wish to acknowledge the efforts of employees and our directors who have made so many contributions to the progress we report here. We also wish to express our gratitude to shareholders, to customers and suppliers for their help and support.

Sincerely,

S. Michael Loveman

S. Michael Loveman
President and Chief Executive Officer

May 21, 1973

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Fiscal 1973 Operations and Planning

Revenues obtained from the sale of gases increased 17 per cent in fiscal 1973 over those of fiscal 1972 and represented 77 per cent of total revenues. Equipment sales, industrial and medical, were up 20 per cent over those of fiscal 1972, and made up 22 per cent of fiscal 1973 revenues. Other income accounted for the remaining one per cent.

Fiscal 1973 marked the eleventh consecutive year we have enjoyed gains in revenues, and as noted earlier, the fiscal 1973 increase was the largest in our history. Total revenues were almost four times what they were ten years ago and 73 per cent greater than five years ago.

Virtually all major product areas contributed to the increase in revenues. Oxygen, which continues to be the sales leader among gases, and nitrogen, second in dollar sales to oxygen, provided significant additional revenue as did argon and hydrogen. Medical gases and specialty gas sales increased as did industrial and medical equipment.

Our traditional business, the sale of industrial gases in cylinders and in liquid state and industrial equipment such as welding equipment, continues to be important and has demonstrated a good growth pattern over the years. We have steadily expanded the geographical boundaries of this phase of our business and presently service an 11-state area from New York to Iowa. It includes such highly industrialized states, besides Ohio, as Pennsylvania, Michigan, Illinois and Indiana. We service this market through 15 company sales and service centers as well as through a network of distributors, and our long-range planning calls for continued emphasis on this market with the establishment of additional company sales and service facilities as well as the addition of new distributors.

New Product Areas

The newer segments of our business—specialty gases, medical gases and equipment, liquid nitrogen and vapor oxygen and nitrogen pipelined to customers from four large on-site production plants—also enjoyed good growth. Together, they presently make up about 40 per cent of our revenues. We consider the growth of these new product areas particularly significant because they represent activity which is apt to be more resistant to cyclical economic influences. For example, our pipeline oxygen and nitrogen business is related principally to chemical, petrochemical and pharmaceutical customers, and like nitrogen, specialty gases are benefiting from the development of new technologies which are creating new markets.

Fiscal 1973 sales of industrial gases very definitely benefited from the return to a more normal level of industrial activity as usage per customer increased. This was particularly true in the case of metalworking operations. Industrial gas sales also benefited from the expansion of applications for our products on the part of customers. Chemical industry customers continue to rely upon nitrogen for a rapidly increasing number of blanketing and inerting processes, and Burdett has become important in supplying liquid nitrogen for food processing. Our food processing customers include meat processors who service leading fast food organizations and provide portion controlled meats to restaurants and institutional feeders, processors of packaged frozen convenience foods and even bottlers of champagne.

Light-Emitting Diodes

Fiscal 1973 specialty gas sales increases reflect growing use of light-emitting diodes in calculators, wrist watches and other numeric display applications. Development and fast-rising use of light-emitting diodes in instrument numeric displays

NITROGEN, once considered by many to be virtually a waste product in the production of oxygen, has become one of the industry's most important products. It now ranks as Burdett's second largest sales producer among gases, just behind oxygen. Nitrogen, because it is inert and thus does not mix with other substances, is an extremely versatile product. It has wide application in the chemical industry as a blanketing agent and Burdett has become a leading supplier of liquid nitrogen to food processors who use it to freeze any number of foods such as pizza.

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represent a logical, sequential step in the acceptance of solid state circuitry in electronics. The diodes are particularly rugged and minute in size with low voltage and current requirements, characteristics which make them ideal for illuminating functions in solid state circuitry designs. In addition to the popular mini calculators, they are being used extensively in computers, in electronic test equipment, medical instrumentation, aircraft controls and even stereo players.

Light-emitting diodes are the product of chemical growth. While the production techniques vary somewhat, gases or dopants such as arsine and/or phosphine are combined under controlled atmospheres to grow a solid ingot. The ingots are sliced into wafers which are then cut into individual chips. After the addition of certain impurities in a process commonly referred to as doping, the chips are mounted and wired in a procedure similar to that used in the manufacture of transistors or other solid state circuitry components. The chips, in fact a solid alloy of gases, accept power and illuminate in much the same way as do vaporous gases in a neon tube.

Another new application for specialty gases is in the air pollution control field where our gases are utilized in equipment designed to measure engine emissions and emissions from stationary sources such as power and chemical plants. Our wholly owned specialty gas subsidiary, Precision Gas Products, now has a number of customers in the automotive field consuming gases used in both laboratory and production line applications to test vehicular power plant emissions.

While the testing programs of the automotive and other vehicular manufacturers tend to be the most far-reaching currently, PGP also is working with agencies, such as the Environmental Protection Agency and the National Bureau of Standards, to develop standard gases for use in programs which deal with major air pollution sources.

Sales of emission control gases were not especially significant in the fiscal year ended February 28 because most of the customers we are supplying were added late in our fiscal year. However, emission control testing in the automotive industry can be expected to accelerate in the years ahead and the gas needs are likely to increase accordingly. And, as noted before, we expect to participate in non-automotive emission control programs.

PGP has specialized in the development and formulation of ultra pure and standard gases for industry, laboratory and academic use. As a result, it has developed the technology of control, purification and compounding essential in the production of gases where the standard of accuracy in some cases may be ±50 parts per billion. Among the component gases used in emission control programs are carbon dioxide, carbon monoxide, hydrocarbons, hydrogen sulfide, oxides of nitrogen and oxides of sulfur. Many are corrosive or reactive, i.e., their properties can be changed by the association of other gases in a compound, and consequently, formulation is a highly technical skill.

Production Capability

In recognition of the potential which the electronics applications for gases and emission control programs represent, we took several steps in fiscal 1973 to support PGP's technical expertise. First, we opened a PGP sales and service office in Detroit to service automotive customers. While PGP has its own in-the-field sales representation, we believe the establishment of the Detroit office, within the geographical area served by Burdett, also will help accelerate our industrial sales department's marketing of PGP specialty gases. We relocated the

EQUIPMENT, industrial and medical, continues to be an important source of revenue for Burdett. Industrial apparatus, such as welding equipment, enjoyed a substantial increase in sales in fiscal 1973, reflecting in large measure a high level of activity on the part of industrial customers. Medical equipment also continues to produce added sales volume, reflecting to a great extent the emphasis the medical profession places on improving patient care as well as product development and improvement by equipment manufacturers.

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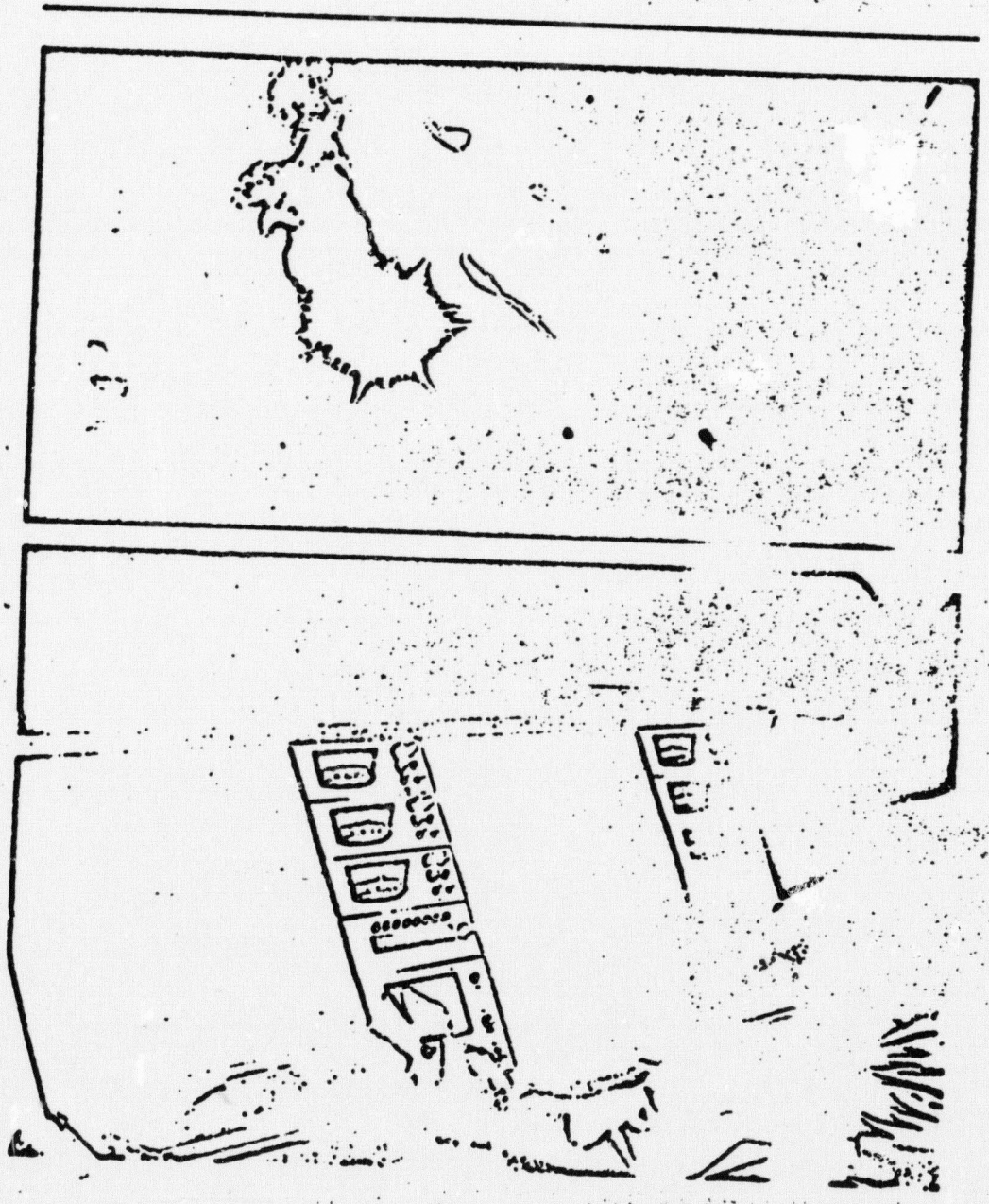

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PGP California sales service/production facility from Orange to a larger plant at Santa Clara so that it would be nearer the area where many of the companies manufacturing diodes and other semiconductors are concentrated. We also purchased equipment which will increase our capability to produce silane, one of the major chemical gases used in the manufacture of diodes. In addition to the new facilities at Detroit and Santa Clara, the PGP main sales/service production plant at Rahway, New Jersey also is being expanded.

Our four large on-site air separation plants—located at Parkersburg, West Virginia, Niagara Falls, New York, Kalamazoo, Michigan and Joliet, Illinois—performed at high levels in fiscal 1973. They service by pipeline major customers for vapor oxygen and nitrogen and produce most of the liquid oxygen and nitrogen we sell in what is referred to as the industrial merchant market which is made up of customers who receive product in liquid form or in cylinders.

The only exception to a near-maximum level of operations by our on-site plants during the year was at Joliet where our principal pipeline customer was inoperative well into our second quarter because of a major fire at the customer's plant. Consequently, our pipeline nitrogen and oxygen output to this customer was lessened although production of liquid nitrogen and oxygen for the merchant market was at a high level all year.

Two new pipeline customers, one to be supplied from the Joliet plant, and the other from the Niagara Falls facility, are under contract to begin receiving service in a few months.

Medical Equipment Sales

Medical equipment sales were good in fiscal 1973 reflecting to a great extent the emphasis hospitals and the medical profession place on upgrading patient care as well as product development and improvement by equipment manufacturers. Incorporation of solid state electronics in instrument design has resulted in more reliable and highly portable and mobile equipment.

Pediatric care equipment continues important. While current and projected birth rate statistics have dictated the closing of obstetrics units in many hospitals, an offsetting trend has been the emergence of neo-natal intensive care centers where top-quality medical specialists and highly sophisticated equipment can be assembled to service a larger geographical area. The concept, similar to that which fostered the sophisticated intensive care units for cardiac patients, is designed to deal with the very special problems of the newborn.

Another development in the medical field is the growing use of disposable items in patient care Disposable monitoring electrodes made a significant contribution to our sales in fiscal 1973 as did a new line of blood transfusion filters which are used to remove impurities from stored blood.

The year in progress is expected to see a number of new equipment products, again reflecting the trend toward solid state instrumentation. Included are a new solid state electrosurgery unit and a lightweight defibrillator. The latter, an instrument which is used to re-start normal heartbeat after an attack, weighs but 15 pounds, one-half to one-third the weight of most units. Also new is a true arrhythmia detector designed to pick up abnormal heart rhythms and which is immune to outside electronic interference, and in the pediatric field, a bed which can be easily converted for use as a crib

SPECIALTY GASES enjoyed significant growth in fiscal 1973. One important new application for them is in the manufacture of light-emitting diodes which are being used extensively in calculators and other instrument numeric display applications. Another new, and growing, specialty gas application is in laboratory and production line inspection of automotive power plant emissions. Special gases formulated by Precision Gas Products, our specialty gas subsidiary, are used to calibrate the instrumentation used by auto companies for their emission control test equipment. PGP, working with the auto companies, assisted in the development of the special gases. Inspection here is by Chrysler at the Chrysler Center, Detroit.

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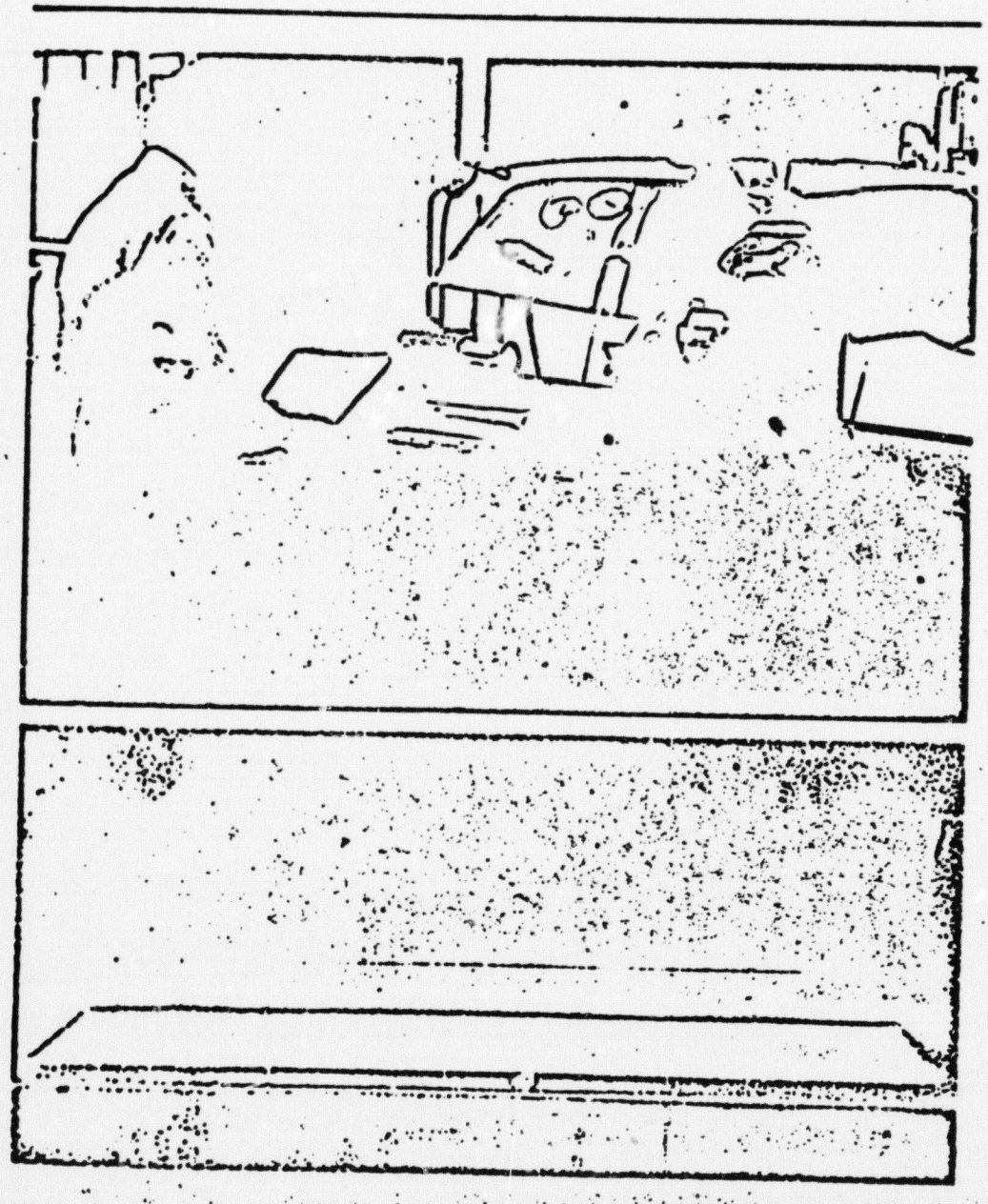

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or as a full-sized bed to accommodate a teenager.

A mini-cardiac monitoring console, which can be moved about to convert virtually any hospital area into a temporary coronary intensive care unit, also will be added to our equipment line.

The fiscal 1973 increase in sales of medical gases, which are used largely in anesthesia and inhalation therapy procedures, is basically the result of new accounts.

Medical gases and equipment are marketed through a special sales force based at offices in Cleveland, Cincinnati, Columbus, Detroit and Pittsburgh.

Industrial Equipment

Fiscal 1973 industrial equipment sales serve as a strong indicator of the pickup in industrial activity over the depressed level of the preceding year. The increase also reflected our additional emphasis on safety products, the demand for which was further stimulated by the enactment of the Occupational Safety & Health Act (OSHA) as well as a revamped, more targeted, more aggressive approach to the marketing of industrial equipment.

Our industrial sales organization has been upgraded and a premium placed on personnel experienced in industrial gas equipment technology. The staff has been expanded to provide back-up technical assistance for industrial equipment sales. We now have, we believe, a particularly vigorous, experienced marketing team.

Another development related to industrial equipment has been the realignment of our product lines. A detailed study undertaken in fiscal 1972

Financial Summary

Burdett Oxygen Co. of Cleveland, Inc.

Results for the Year Ended February 28/29	1973	1972*	1971
Sales and Other Revenues	$21,950,000	$18,602,000	$17,383,000
Income (Loss) Before Extraordinary Items	125,000	(536,000)	(1,648,000)
Net Income (Loss)	244,000	(536,000)	(1,506,000)
Depreciation and Amortization	1,415,000	1,456,000	1,942,000
At Year End			
Property, Plant, Equipment, Gross	$29,852,000	$30,202,000	$30,370,000
Accumulated Depreciation and Amortization	13,010,000	12,171,000	11,179,000
Long-Term Debt	16,956,000	18,402,000	17,945,000
Shareholders' Equity	4,055,000	3,260,000	3,676,000
Per Share			
Income (Loss) Before Extraordinary Items	$ .11	$ (.62)	$ (1.91)
Extraordinary Items	.11	—	.16
Net Income (Loss)	.22	(.62)	(1.75)
Shareholders' Equity	4.06	3.79	4.27
Average Shares Outstanding	1,341,634	860,525	860,325

During the fiscal year 1972, the estimated useful lives of the air separation plants were extended; thereby reducing depreciation expense and net loss by $350,000.

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indicated duplication of products by suppliers. This was costly in terms of inventories and frequently we lost the advantage of large volume purchases because we were obtaining similar products from a number of suppliers. It also made selling more difficult for the individual salesman because he had to deal with so many items.

We have reduced drastically the number of products we carry, cutting the number of suppliers of this equipment from the 87 we had in November, 1971, to 37 at the present time. Our criteria for this realignment included product quality, profitability and the reputation of the manufacturer for service and product promotion. The equipment we now carry is that of some of the leading suppliers in the industry.

We also again are developing our own equipment. We recently introduced a Burdett designed rectilineal flame cutting machine, models of which will be available with four to six cutting torches and which will sell from $10,000 to $18,000. The units are designed to fill the particular needs of smaller organizations such as tool and die makers and steel warehouses, and thus are largely targeted to our merchant markets customers.

We are marketing a new highly mobile power source incorporating an air compressor, welding machine and primary power generator. Designated Burdox Power 3, the unit powered by a diesel engine is expected to have a wide variety of uses in industrial applications and many types of construction.

1970	1969	1968	1967	1966	1965	1964
$16,716,000	$14,579,000	$12,703,000	$11,999,000	$10,268,000	$ 8,615,000	$ 7,486,000
(1,396,000)	61,000	329,000	372,000	363,000	251,000	306,000
(1,396,000)	274,000	464,000	391,000	388,000	258,000	485,000
1,586,000	1,432,000	1,095,000	900,000	706,000	539,000	443,000
$30,230,000	$26,571,000	$18,913,000	$17,180,000	$13,277,000	$10,293,000	$ 7,241,000
9,353,000	[illegible]200	6,564,000	5,607,000	4,702,000	4,095,000	3,537,000
18,063,000	[illegible]69,000	8,224,000	8,637,000	5,736,000	3,397,000	1,017,000
5,182,000	6,554,000	6,251,000	5,615,000	5,276,000	4,812,000	4,356,000
$ (1.65)	$ .08	$ .43	$ .49	$ .49	$ .36	$ .46
—	.26	.17	.02	.03	.01	.27
(1.65)	.34	.60	.51	.52	.37	.73
6.14	8.16	7.91	7.33	6.94	6.61	6.54
843,922	796,960	778,456	763,315	744,335	697,117	665,792

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Consolidated Statement of Income (Loss) and Retained Earnings

Burdett Oxygen Co. of Cleveland, Inc.

	Year Ended February 28, 1973	Year Ended February 29, 1972
Net sales	$20,634,000	$17,549,000
Demurrage	979,000	832,000
Other income	337,000	221,000
	21,950,000	18,602,000
Costs and expenses:		
Cost of products sold and distribution expenses	16,601,000	14,117,000
Selling and administrative expenses	3,853,000	3,677,000
Interest	1,234,000	1,344,000
	21,688,000	19,138,000
Income (loss) before income taxes and extraordinary item	262,000	(536,000)
Provision for income taxes:		
In lieu of Federal income taxes (Note 6)	119,000	—
State	18,000	—
	137,000	—
Income (loss) before extraordinary item	125,000	(536,000)
Federal income tax benefit from realization of operating loss carryforward (Note 6)	119,000	—
Net income (loss)	244,000	(536,000)
Retained earnings at beginning of year	1,640,000	2,176,000
Retained earnings at end of year	$ 1,884,000	$ 1,640,000
Per common and common equivalent share (Note 8):		
Income (loss) before extraordinary item	$ .11	$ (.62)
Extraordinary item	.11	—
Net income (loss)	$ .22	$ (.62)

See accompanying notes to consolidated financial statements.

Report of Independent Accountants

The Board of Directors and Shareholders
of Burdett Oxygen Co. of Cleveland, Inc.

In our opinion, the accompanying consolidated balance sheet and the related consolidated statements of income (loss) and retained earnings and of changes in financial position present fairly the financial position of Burdett Oxygen Co. of Cleveland, Inc. and its subsidiaries at February 28, 1973 and February 29, 1972, the results of their operations and the changes in financial position for the years then ended, in conformity with generally accepted accounting principles consistently applied.

Our examinations of these statements were made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

PRICE WATERHOUSE & Co.

Cleveland, Ohio
May 9, 1973

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Consolidated Balance Sheet

Burdett Oxygen Co. of Cleveland, Inc.

	February 28, 1973	February 29, 1972
Assets		
Current assets:		
Cash	$ 249,000	$ 543,000
Certificates of deposit	1,000,000	500,000
Trade accounts and notes receivable, less allowance of $306,700 and $342,000 respectively (Note 3)	3,553,000	4,163,000
Inventories, at lower of cost (first-in, first-out) or market (Note 3)	1,579,000	1,430,000
Prepaid expenses, spare parts and sundry receivables	1,110,000	945,000
Total current assets	7,491,000	7,581,000
Cash value of life insurance	103,000	96,000
Property, plant and equipment, at cost (Notes 2 and 3):		
Land and improvements	613,000	608,000
Buildings	3,512,000	3,512,000
Machinery and equipment	25,727,000	26,082,000
	29,852,000	30,202,000
Accumulated allowance for depreciation and amortization	13,010,000	12,171,000
	16,842,000	18,031,000
Other assets:		
Financing costs, less amortization (Note 2)	316,000	343,000
Excess of cost of assets acquired over assigned value	50,000	50,000
Other intangible assets at cost, less amortization	—	33,000
	366,000	426,000
	$24,802,000	$26,134,000
Liabilities and Shareholders' Equity		
Current liabilities:		
Current portion of long-term debt	$ 334,000	$ 110,000
Accounts payable and accrued expenses	3,067,000	3,205,000
Total current liabilities	3,451,000	3,315,000
Long-term debt, noncurrent portion (Note 3)	16,956,000	18,482,000
Contractual obligations (Note 4) and cylinder deposits	80,000	817,000
Deferred income taxes	260,000	260,000
Shareholders' equity:		
Cumulative preferred stock, $1 par value, 500,000 shares authorized and unissued		
Common stock, $1 par value - authorized 2,400,000 shares; issued 1,001,241 and 861,832 shares, respectively (Note 7)	1,001,000	862,000
Capital in excess of par value (Note 7)	1,182,000	770,000
Retained earnings (Note 3)	1,884,000	1,640,000
	4,067,000	3,272,000
Less - 1,307 shares of common stock in treasury, at cost	12,000	12,000
Total shareholders' equity	4,055,000	3,260,000
Commitments and contingencies (Note 9)		
	$24,802,000	$26,134,000

See accompanying notes to consolidated financial statements.

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Consolidated Statement of Changes in Financial Position

Burdett Oxygen Co. of Cleveland, Inc.

	Year Ended	
	February 28, 1973	February 29, 1972
Financial resources were provided by:		
Income (loss) before extraordinary item	$ 125,000	$ (536,000)
Charges not affecting working capital—		
Depreciation	1,355,000	1,399,000
Amortization of financing costs and intangible assets	60,000	57,000
Working capital provided by operations	1,540,000	920,000
Federal income tax benefits from realization of net operating loss carryforward	119,000	—
Net proceeds from refinancing:		
Proceeds from borrowings	—	11,500,000
Repayment of construction and bank loans	—	(10,750,000)
Costs incidental to refinancing excluding $120,000 of value assigned to warrants	—	(118,000)
Net proceeds from refinancing	—	632,000
Cash advances from pipeline customer (Note 4)	160,000	195,000
Common stock issued in exchange for contractual obligations and long-term debt (Note 4)	551,000	—
Disposals of machinery and equipment	104,000	43,000
Other items	—	64,000
	2,474,000	1,854,000
Financial resources were used for:		
Additions to property, plant and equipment	270,000	279,000
Reduction of long-term debt and contractual obligations by:		
Exchange for common stock (Note 4)	551,000	—
Payments or transfer to current liabilities	1,872,000	317,000
Other items	7,000	—
	2,700,000	596,000
Increase (decrease) in working capital	$ (226,000)	$ 1,258,000
Analysis of Changes in Working Capital		
Increase (decrease) in working capital:		
Cash and certificates of deposit	$ 206,000	$ 753,000
Trade receivables	(610,000)	249,000
Inventories	149,000	62,000
Prepaid expenses, spare parts and sundry receivables	165,000	(225,000)
Current portion of long-term debt	(274,000)	15,000
Accounts payable and accrued expenses	133,000	404,000
Increase (decrease) in working capital	$ (226,000)	$ 1,258,000

See accompanying notes to consolidated financial statements.

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Notes to Consolidated Financial Statements

Note 1—Principles of Consolidation

The consolidated financial statements include the accounts of Burdett Oxygen Co. of Cleveland, Inc. and its subsidiaries. All significant intercompany transactions, profits and balances have been eliminated in consolidation.

Note 2—Depreciation and Amortization

Depreciation in the accompanying financial statements is computed using principally the straight-line method and estimated useful lives of 10 to 20 years for machinery and equipment and 18 to 33 years for buildings.

Financing costs are being amortized over the term of the related long-term debt.

Note 3—Long-Term Debt

In accordance with the various secured loan agreements and related security agreements, the Company's inventory, accounts and notes receivable, and property, plant and equipment are pledged as collateral. In addition, the loan agreements contain restrictive covenants which provide, among other things, for limitations on additional indebtedness, distributions of cash dividends and transactions in the Company's own stock; and maintenance of $2,000,000 working capital. Under the most restrictive covenants, the Company can pay cash dividends based on 60% of net earnings, as defined, accumulated after February 28, 1973.

Other information regarding the long-term debt of the Company is set forth in the following tabulation:

	February 28, 1973	February 29, 1972
Secured loans:		
Insurance company, 7¼% due in semi-annual installments of $250,000 commencing December 31, 1974, and increasing to $450,000 effective June 30, 1976	$10,000,000	$10,000,000
Insurance company, 8% due in quarterly installments of $36,000 commencing March 1, 1973	2,831,000	2,923,000
Bank loan, 2½% above prime rate, due April, 1973	—	4,000,000
Mortgages and other secured notes, payable 5% to 6½% maturing at various dates to 1981	295,000	364,000
Unsecured:		
5½% notes due quarterly to 1973	127,000	173,000
Subordinated debt:		
7¼% notes due 1981	500,000	500,000
Non-interest bearing note due 1976 (Note 4)	87,000	130,000
5% convertible debentures due 1986	3,500,000	3,500,000
	17,340,000	18,592,000
Less current portion	384,000	110,000
	$16,956,000	$18,482,000

The aggregate amounts of long-term debt maturing in each of the four years subsequent to February 28, 1974, are $730,000, $943,000, $1,392,000 and $1,298,000, respectively.

Note 4—Contractual Obligations

An agreement with the Joliet plant pipeline customer provides that under stipulated conditions the customer will advance up to $213,000 per year through December 31, 1975, based on defined operating results.

At February 29, 1972, advances totaling $195,000 as well as $390,000 relating to prior settlement of certain claims ($130,000 of which was classified as long-term debt) had been received by the Company. During fiscal year 1973 additional advances of $160,000 were received of which $107,000 relating to 1973 will be refunded and is classified as a current liability. Also during fiscal year 1973, $551,000 of these debt instruments were exchanged by the customer for 126,634 shares of the Company's common stock as permitted by the agreement. At February 28, 1973, $87,000 (classified as long-term debt) remains outstanding and is exchangeable for common stock of the Company under variable terms or may be applied against purchases of certain products.

At February 29, 1972, contractual obligations included $239,000 claimed under contract by the prime process equipment contractor for the Joliet plant against which the Company had made claims against the contractor. During fiscal year 1973 these claims were settled resulting in a reduction of the amount due the contractor. The cost of machinery and equipment for the Joliet plant has been adjusted for these reductions, net of costs incurred.

Note 5—Pension Plans

The Company has various non-contributory pension plans covering substantially all employees. Effective July 1, 1972, the Company adopted a plan providing for payments to trustees. The cost of this plan for 1973 was $61,000 which included amortiza-

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tion of past service costs over 40 years. The Company also has a number of plans providing for payments directly to trustees which administer the plans for covered union members. The cost of these plans for 1973 was $66,000 and $56,000 for 1972.

Note 6—Federal Income Taxes

No Federal income tax is payable for fiscal year 1973 because of available net operating loss carryforwards. However, the statement of income includes a provision in lieu of the Federal income taxes that would have been required in the absence of the net operating loss carryforward. The benefits arising from the realization of the net operating loss have been reflected as an extraordinary item.

At February 28, 1973, the Company has available for Federal income tax purposes net operating loss carryforwards of approximately $1,500,000 (expiring $1,100,000 in 1976 and $400,000 in 1977) and approximately $1,300,000 of unused investment credits (expiring $100,000 in 1974, $400,000 in 1975, $100,000 in 1976 and $700,000 in 1977). Operating loss carryforwards available for financial statement purposes are approximately $2,100,000.

Note 7—Common Stock, etc.

Changes in common stock outstanding and capital in excess of par value for fiscal years 1973 and 1972 are reflected below:

	Common Stock	Capital in Excess of Par Value
Balance February 28, 1971	$ 842,000	$ 650,000
Estimated value of warrants issued	—	120,000
Balance at February 29, 1972	842,000	770,000
Shares issued based on earnings of company acquired in 1969 on pooling of interest basis	12,000	(12,000)
Shares issued on exchange of long-term debt and contractual obligation	127,000	424,000
Balance at February 28, 1973	$1,001,000	$1,182,000

At February 28, 1973, a maximum of 1,140,500 shares of common stock are reserved for options, warrants, convertible debt, etc.

During the year ended February 28, 1973, the following share transactions occurred in connection with the employee stock option plans:

	1960 Plan	1966 Plan	1970 Plan
Balance February 29, 1972:			
Under option	17,873	5,100	12,500
Available for option	—	17,834	37,500
Changes in fiscal year 1973:			
Granted	—	2,000	—
Cancelled and expired	2,625	1,100	—
Balance February 28, 1973:			
Under option	15,248	6,000	12,500
Available for option	—	16,934	37,500

Under the 1960 Plan, options were granted at a price of $3.80 and the market price at the time was $4.00. All options under this plan are exercisable and expire August 1, 1973. Options outstanding under the 1966 and 1970 Plans were granted at prices ranging from $4.50 to $16.00 per share, representing the market prices at date of grants. These options are exercisable two years after grant at the rate of 33-1/3% of original grant per year, except for 7,000 shares under the 1970 plan which are exercisable one year after grant at the rate of 50% of original grant per year.

Note 8—Earnings (Loss) Per Share

Earnings per common share were computed based on average number of shares outstanding during each year, increased in fiscal year 1973 when dilutive, by the number of shares issuable on the exercise of options and warrants net of shares assumed to have been purchased with the proceeds from the exercise of options and warrants and the conversion of contractual obligations including the note due in 1976. Such average shares were 1,341,634 in 1973 and 860,525 in 1972. The convertible debentures due in 1986, which are not common stock equivalents, have not been assumed converted because such conversion would be antidilutive.

Note 9—Commitments and Contingencies

The Company leases certain facilities and equipment under agreements which expire through 1981. Annual lease commitments for the next fiscal year amount to approximately $1,451,000 and decline thereafter to $37,000 in fiscal 1981.

An action claiming $327,000 for financial consulting services is pending against the Company, however, no provision has been made in the financial statements because the Company is disputing the validity of the claim.

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Officers/Directors

Directors

Milton N. Allen, *Managing Partner, Mandate Corporation*

Jordan C. Band, *Secretary*

George R. Herzog, *Retired Chairman, Union Commerce Bank*

*W. H. Loveman, *Chairman, Executive Committee, Honorary Director*

S. M. Loveman, *President and Chief Executive Officer*

Henry J. McGinness, *Attorney-at-Law*

Roy B. Miner, *President, Cook United, Inc.*

Arthur B. Modell, *President, Cleveland Browns Football Club*

H. E. Scherl, *Executive Vice President*

Dudley J. Taw, *Vice President—Marketing, The East Ohio Gas Company*

*Deceased May 14, 1972

Officers

S. M. Loveman, *President and Chief Executive Officer*

H. E. Scherl, *Executive Vice President*

Jerry G. Dralle, *Vice President—Industrial Sales*

Herbert G. Gill, *Vice President—Specialty Gases*

Ira F. Godin, *Vice President—Medical Sales*

Larry R. Mann, *Vice President*

Kurt R. Rose, *Vice President—Operations*

Kenneth E. Love, *Treasurer*

Jordan C. Band, *Secretary*

Hans Mueller, *Controller*

D. Bader, *Assistant Secretary*

Plants and Sales Offices

Buffalo, N. Y.*
Chicago, Ill.*
Cincinnati, Ohio*§
Cleveland, Ohio*§† ✓
Columbus, Ohio*§
Dayton, Ohio*† ✓
Detroit, Mich.*§†‡ ✓
Findlay, Ohio*† ✓
Fort Wayne, Ind.*
Indianapolis, Ind.*
Joliet, Ill.† ✓
Kalamazoo, Mich.*† ✓
Mansfield, Ohio*
Niagara Falls, N. Y.† ✓
Parkersburg, W. Va.*† ✓
Pittsburgh, Pa.*§
Rahway, N. J.‡
Santa Clara, Calif.‡
Youngstown, Ohio*

† *Production Facility*
* *Industrial Sales/Service Office*
§ *Medical Sales/Service Office*
‡ *Precision Gas Products Sales & Production*

END

General Counsel
Ulmer, Berne, Laronge, Glickman & Curtis, Cleveland

Independent Accountants
Price Waterhouse & Co., Cleveland

Registrar and Transfer Agent
Union Commerce Bank, Cleveland

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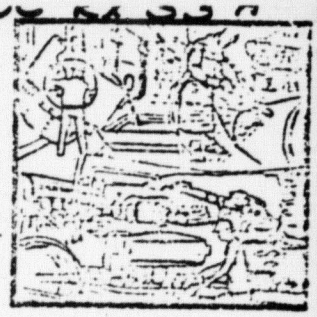
A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

CURRENT INDUSTRIAL REPORTS

A 5094

Industrial Gases

1972



U. S. DEPARTMENT OF COMMERCE • Social and Economic Statistics Administration • BUREAU OF THE CENSUS

July 1973

SERIES: M28C(72)-14

Shipments of industrial gases by primary manufacturers in 1972 totaled $599 million, or about 2 percent less than the 1971 figure of $609 million. The 1972 total is composed of $95 million for acetylene; $39 million for carbon dioxide; and $465 million for the product grouping elemental gases and other industrial gases, n.e.c. Compared with 1971, the 1972 totals showed a 9 percent decrease for acetylene, an increase on 1 percent for carbon dioxide, and a decrease of 1 percent for other elemental gases.

Figures in this report exclude values for hydrocarbon gases, such as propane, butane and propylene, or halogenated hydrocarbons and cyclopropane, which are reported to the United States Tariff Commission, and for sulfur dioxide and chlorine, which are shown in the Current Industrial Reports, Series M28A(72)-14, Inorganic Chemicals and Gases.

The shipments values for some of the gases, particularly oxygen, reported by companies vary widely not only because of the conditions of sales, including delivery by pipeline or cylinder, but also because plant operations differ. The manufacturing and selling activities of some companies are centralized at the primary production site, while other companies sell or ship liquefied gases to other sites (filling stations or conversion units) where the products are changed in form, "packaged," and sold. The values reported for some sites thus include marketing activities and for other sites do not.

Figures showing the quantities shipped to other plants of the same company (interplant transfers) were not compiled separately and thus are unavailable. In evaluating these interplant transfers for inclusion in the totals, respondents were instructed to report values which would approximate the commercial selling value, f.o.b. plant, and not the cost of production or some other book price.

Beginning in 1971, respondents were requested to report production either by specific methods of shipment or consumption in the producing plants for selected elemental gases and acetylene. Data for hydrogen, nitrogen and oxygen include lower purity and high purity gas. Prior to 1971, lower purity gas was collected separately. Statistics for crude argon are collected separately. Special reporting instructions are also provided for carbon dioxide producers so that the chemical produced and shipped is reported only once, either in solid or liquid (including gaseous) form. Statistics exclude such activities as the liquefaction of purchased nitrogen. The quantities reported as produced exclude any information for gases used as fuel in

Inquiries concerning these figures should be addressed to the U.S. Department of Commerce, Bureau of the Census, Industry Division, Washington, D.C. 20233. This publication is for sale by the Bureau of the Census, Price: 15 cents per copy – $1.50 per year.

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producing plant, vented, or disposed of as waste. Other limitations of the statistics are indicated in footnotes appearing at the end of table 1.

In addition to the annual production statistics shown in table 1, monthly statistics for specified gases are shown in table 8. These monthly statistics supersede those which were released earlier in the monthly Current Industrial Reports, Series M28C, Industrial Gases, United States Production. Monthly and annual statistics have been issued beginning with January 1941. Geographic totals for specific gases are shown in tables 2 through 7. The geographic distribution of industrial gas plants by State is shown in table 9.

All figures included in this report are collected in thousand cubic feet, 70 F, at 1 atmosphere pressure, unless otherwise specified.

ACKNOWLEDGMENTS--This report was prepared in the Industry Division under the direction of Lonnie M. Conner, Chief for Chemicals, Wood Products, and Nonmetallic Minerals Branch. Doris W. Funk, Chief, Chemicals, assisted by John P. Govoni, was directly responsible for the review of the data and preparation of the report. Elmer S. Biles, Chief of the Division, provided overall direction and coordination to this project.

Table 1.--ANNUAL PRODUCTION AND SHIPMENTS OF INDUSTRIAL GASES: 1968 TO 1972

Code	Product	Unit of measure	Year	Quantity produced for all purposes	Total shipments including transfers quantity	Total shipments including transfers value ($1,000)
2813---	Industrial gases, total		1972	(X)	(X)	r$568,774
			1971	(X)	(X)	r$679,052
			1970	(X)	(X)	$633,902
			1969	(X)	(X)	$623,114
			1968	(X)	(X)	$607,521
2813200	Acetylene[3]	Mil.cu.ft.	1972	11,568	7,238	94,524
			1971	r12,349	r7,718	r102,592
			1970	14,834	8,926	99,952
			1969	15,618	9,372	94,542
			1968	15,071	8,151	89,025
	Produced for pipeline shipment excluding that shipped to be compressed	...do....	1972	5,738	5,738	r52,069
			1971	r6,185	r6,185	r58,343
	Produced for compression, including cylinder and pipeline	...do....	1972	1,507	1,502	42,455
			1971	r1,515	r1,533	r44,249
	Produced for consumption in this plant	...do....	1972	4,323	(X)	(X)
			1971	4,649	(X)	(X)
	Carbon dioxide, total	Short tons	1972	1,481,287	1,371,459	39,159
			1971	r1,344,026	r1,235,442	r34,963
			1970	1,135,454	1,028,290	37,142
			1969	1,166,611	1,079,401	40,627
			1968	1,058,120	943,466	41,774
2813311	Liquid and gas	...do....	1972	[3]1,174,748	1,064,309	33,367
			1971	[3]1,027,327	929,575	r31,373
			1970	[3]814,510	710,743	29,467
			1969	[3]802,429	714,629	29,915
			1968	[3]684,014	575,945	27,491
2813331	Solid (dry ice)	...do....	1972	r306,539	306,651	15,792
			1971	316,699	314,967	17,590
			1970	320,644	317,547	17,675
			1969	364,182	364,772	19,712
			1968	374,106	367,521	19,283
28134--	Elemental gases and other industrial gases, n.e.c., total	.....	1972	(X)	(X)	r$65,091
			1971	(X)	(X)	r$87,497
			1970	(X)	(X)	$87,508
			1969	(X)	(X)	$83,945
			1968	(X)	(X)	$76,722
2813415	Argon, high purity, total	Mil.cu.ft.	1972	3,804	3,804	33,096
			1971	r3,048	r3,042	r29,136
			1970	2,712	2,741	33,140
			1969	2,597	2,526	30,659
			1968	2,114	2,113	33,162
	Produced for cylinder and bulk delivery shipment	...do....	1972	3,804	3,804	33,096
			1971	r3,048	r3,042	r29,136
	Helium[4]	...do....	1972	(NA)	(NA)	(NA)
			1971	4,565	447	(NA)
			1970	4,630	542	(NA)
			1969	4,662	670	(NA)
			1968	4,658	802	(NA)
2813420	Hydrogen, total	...do....	1972	[5]58,830	17,952	30,323
			1971	[5]55,681	r17,470	r34,703
			1970	[5]59,654	20,940	35,380
			1969	[5]64,821	25,456	38,101
			1968	[5]201,752	28,255	37,822
	Produced for cylinder and bulk delivery shipment	...do....	1972	5,463	5,458	13,774
	Liquid produced for conversion to gas	...do....	1971	r5,324	r5,237	r13,102
	Produced for pipeline shipment	...do....	1972	12,434	12,434	23,549
	Liquid produced for government use	...do....	1971	r12,300	r12,173	r22,591
	Produced for consumption in this plant	...do....	1972	40,593	(X)	(X)
			1971	r38,047	(X)	(X)
2813440	Nitrogen, total[6]	...do....	1972	r[7]193,310	[7]176,833	r[7]132,358
			1971	r[7]168,040	r[7]153,738	r[7]124,117
			1970	151,121	134,825	[8]123,032
			1969	130,641	118,303	[8]108,635
			1968	118,731	105,370	[8]101,777
	Gas:					
	Produced for cylinder and bulk delivery shipment	...do....	1972	771	770	3,030
			1971	r635	r642	r2,502
	Produced for pipeline shipment	...do....	1972	112,234	112,333	23,109
			1971	r94,528	r99,630	r24,150
	Produced for consumption in this plant	...do....	1972	11,950	(X)	(X)
			1971	r13,877	(X)	(X)

See footnotes at end of table.

Table 1.--ANNUAL PRODUCTION AND SHIPMENTS OF INDUSTRIAL GASES: 1968 TO 1972--Continued

Code	Product	Unit of measure	Year	Quantity produced for all purposes	Total shipments including transfers quantity	Total shipments including transfers value ($1,000)
	Elemental gases and other industrial gases, n.e.c.--Continued					
	Nitrogen[5]--Continued					
	Liquid:					
	Produced for cylinder and bulk delivery shipment	Mil.cu.ft.	1972	58,951	58,853	92,234
			1971	r53,183	r53,182	r93,027
	Produced for bulk shipment to pipelines or to other air separation plants	...do....	1972	5,095	5,091	4,575
			1971	4,319	r4,313	r4,396
	Produced for consumption in this plant	...do....	1972	1,534	(X)	(X)
			1971	r1,688	(X)	(X)
2813450	Oxygen, total[6]	...do....	1972	r333,190	r301,756	r216,743
			1971	r319,171	r284,882	r238,250
			1970	283,880	273,465	[8]237,875
			1969	275,962	264,958	[8]229,454
			1968	247,995	238,408	[8]224,847
	Gas:					
	Produced for cylinder and bulk delivery shipment	...do....	1972	530	540	4,341
			1971	r499	r499	r4,220
	Produced for pipeline shipments	...do....	1972	216,963	216,998	119,[illegible]
			1971	r218,176	r218,187	r107,[illegible]
	Produced for consumption in this plant	...do....	1972	(9)	(X)	(X)
			1971	(9)	(X)	(X)
	Liquid:					
	Produced for cylinder and bulk delivery shipments	...do....	1972	43,943	43,943	81,229
			1971	r40,559	r40,559	r95,464
	Produced for bulk shipment to pipeline or to other air separation plants	...do....	1972	10,275	10,275	12,150
			1971	r9,637	r9,637	r19,[illegible]
	Produced for consumption in this plant	...do....	1972	r51,479	(X)	(X)
			1971	r50,300	(X)	(X)
2813471	Nitrous oxide	1,000 gals (STP)	1972	1,278,285	1,278,285	4,[illegible]0
			1971	1,121,366	1,121,366	4,[illegible]7
			1970	1,098,553	1,098,342	3,[illegible]0
			1969	1,052,712	1,051,910	3,[illegible]7
			1968	996,658	996,586	3,837
2813498	Other industrial gases, n.e.c., including crude argon, carbon dioxide produced and transferred for further processing, and crude and high purity helium produced in privately owned plants[10]	.....	1972	(X)	(X)	50,[illegible]51
			1971	(X)	(X)	r48,[illegible]24
			1970	(X)	(X)	[8]55,[illegible]91
			1969	(X)	(X)	[8]60,[illegible]78
			1968	(X)	(X)	[8]62,[illegible]07

(NA) Not available. n.e.c. Not elsewhere classified. rRevised. (X) Not applicable.

[8]Excludes value for helium produced in government owned plants.

[7]Excludes information from railroad ships, shipyards, welding shops, and small establishments using portable generators.

[3]Excludes production of liquid and gas carbon dioxide converted to and reported as dry ice and also amounts converted from pure carbon dioxide (liquid or solid) purchased or received from other plants. Also excludes quantities produced and consumed in plants manufacturing soda ash or urea, and quantities produced and transferred to other plants where it is further processed.

[4]Source: U.S. Department of Interior, Bureau of Mines.

[5]Excludes amounts vented, used as fuel, etc., and amounts produced and consumed in the manufacture of synthetic ammonia and methanol. But includes an unspecified amount produced for sale or interplant transfer to plants consuming this gas in the production of ammonia. Also excludes amounts produced by the ammonia dissociation process (cracking of ammonia). Also excludes amounts produced in petroleum refineries for captive use. However, of the total shown for lower purity hydrogen prior to 1969, 70 to 75 percent was accounted for by petroleum refiners with captive hydrogen production. Not all such petroleum refineries were canvassed in this survey.

[6]Excludes amounts produced and consumed in the manufacture of synthetic ammonia or ammonia derivatives.

[7]Data for 1972 and 1971 include figures for high and lower purity gas. Prior to 1971, data only included figures for high purity gas.

[9]Data for lower purity nitrogen and lower purity oxygen combined with code 2813498 for 1968 through 1970.

[8]Data for oxygen (gas), produced for consumption in this plant, combined with data for oxygen (liquid), produced for consumption in this plant, to avoid disclosing figures for individual companies.

[10]Excludes hydrocarbon gases such as propane, butane, and propylene, or halogenated hydrocarbons and cyclopropane, which are reported to the U.S. Tariff Commission. Also excludes sulfur dioxide and chlorine, figures for which are shown in Current Industrial Reports Series MISA (72)-14, Inorganic Chemicals and Gases.

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Table 2.--PRODUCTION AND SHIPMENTS OF ACETYLENE, BY GEOGRAPHIC AREA: 1972

Production	Production (mil. cu. ft.)	Total shipments including interplant transfers	
		Quantity (mil. cu. ft.)	Value ($1,000)
UNITED STATES, TOTAL[1]	11,568	7,238	94,524
Northeast Region and North Central Region	1,163	949	21,957
South Region	9,930	6,031	64,490
Mountain Division	97	77	2,196
Pacific Division	378	181	5,881

[1]See table 9 for the number of establishments reporting production by State.

Table 3.--PRODUCTION AND SHIPMENTS OF CARBON DIOXIDE, BY DIVISIONS: 1972

Division	Total liquid and solid			Liquid and gas			Solid (dry ice)		
	Production (short tons)	Shipments		Production (short tons)	Shipments		Production (short tons)	Shipments	
		Quantity (short tons)	Value ($1,000)		Quantity (short tons)	Value ($1,000)		Quantity (short tons)	Value ($1,000)
UNITED STATES, TOTAL[1]	1,441,287	1,371,459	39,159	1,174,748	1,064,808	23,347	308,539	304,651	15,792
New England and Middle Atlantic	96,504	93,640	3,057	58,931	56,316	1,091	37,553	37,324	1,946
East North Central	284,751	287,115	8,373	213,981	196,345	4,245	70,770	70,770	4,128
West North Central	260,572	253,749	6,558	222,230	215,266	4,486	38,342	38,483	2,072
South Atlantic and East South Central	281,814	251,828	9,670	232,404	202,418	6,629	49,410	49,410	3,041
West South Central	296,333	249,379	5,891	275,723	229,369	4,713	20,610	20,010	1,178
Mountain	57,745	57,745	1,280	26,336	26,336	376	31,409	31,409	904
Pacific	203,568	197,303	4,330	145,063	138,798	1,827	58,505	58,505	2,503

[1]See table 9 for the number of establishments reporting production by State.

Table 4.--SHIPMENTS OF ARGON (HIGH PURITY) BY GEOGRAPHIC AREA: 1972

Geographic area	Total shipments including interplant transfers	
	Quantity (mil. cu. ft.)	Value ($1,000)
UNITED STATES, TOTAL[1]	3,804	33,096
Northeast Region	855	6,619
East North Central Division	1,375	11,670
Ohio	464	3,964
South Atlantic Division	521	5,162
East South Central Division	101	1,213
West South Central Division	412	3,342
West Region	540	4,791
California	439	3,524

[1]See table 9 for the number of establishments reporting production by State.

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Table 5.--PRODUCTION AND SHIPMENTS OF HYDROGEN (TOTAL) BY GEOGRAPHIC AREA: 1972

Geographic area	Production (mil. cu. ft.)	Total shipments including interplant transfers	
		Quantity (mil. cu. ft.)	Value ($1,000)
UNITED STATES, TOTAL[1]	58,890	17,952	30,323
Northeast Region	4,971	2,453	7,092
North Central Region	5,632	2,261	4,593
South Region and West Region	48,287	13,238	18,638
East South Central Division	5,070	1,715	1,444
West South Central Division	30,094	3,343	7,610

[1]See table 9 for the number of establishments reporting production by State.

Table 6.--PRODUCTION AND SHIPMENTS OF NITROGEN (TOTAL) BY GEOGRAPHIC AREA: 1972

Geographic area	Production (mil. cu. ft.)	Total shipments including interplant transfers	
		Quantity (mil. cu. ft.)	Value ($1,000)
UNITED STATES, TOTAL[1]	193,540	176,833	130,358
New England Division	3,141	3,104	3,807
Middle Atlantic Division	23,721	22,566	22,703
New York	3,576	3,193	3,003
New Jersey	8,563	8,519	10,657
Pennsylvania	11,582	10,854	9,043
North Central Region	39,422	37,869	31,515
Ohio	11,320	10,901	9,088
Illinois	8,503	8,252	8,616
South Atlantic Division	30,242	25,843	16,038
West Virginia	11,973	7,601	3,732
East South Central Division	12,251	10,182	9,217
Tennessee	4,718	3,156	2,386
Alabama	4,604	4,804	5,740
West South Central Division	62,323	55,670	22,864
Texas	50,107	45,839	17,195
Mountain Division	1,768	1,768	2,353
Utah	245	245	441
Pacific Division	20,672	19,831	21,001
California	19,117	19,036	19,210

[1]See table 9 for the number of establishments reporting production by State.

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Table 7.--PRODUCTION AND SHIPMENTS OF OXYGEN (TOTAL) BY GEOGRAPHIC AREAS: 1971

Geographic area	Production (mil. cu. ft.)	Total shipments including interplant transfers	
		Quantity (mil. cu. ft.)	Value ($1,000)
UNITED STATES, TOTAL[1]	353,190	301,756	218,763
New England Division	1,117	1,105	2,074
Middle Atlantic Division	67,138	66,485	45,968
New York	12,132	12,075	8,048
New Jersey	2,907	2,910	5,950
Pennsylvania	52,099	51,500	31,968
North Central Region	127,251	111,528	72,960
Ohio	38,942	38,977	21,991
Michigan	19,161	10,050	6,341
South Atlantic Region	35,905	33,792	24,884
West Virginia	20,386	18,369	12,162
Florida	1,203	1,203	1,842
East South Central Division	23,260	23,187	22,060
Alabama	8,737	8,736	8,567
West South Central Division	75,230	42,738	25,287
Texas	56,535	35,291	19,508
Mountain Division	7,102	6,735	6,087
Utah	3,488	3,122	2,356
Pacific Division	16,187	16,186	17,445
California	14,688	14,688	14,978

[1]See table 9 for number of establishments reporting production by State.

Table 8.--PRIMARY PRODUCTION OF SPECIFIED INDUSTRIAL GASES, BY MONTHS: 1972 AND 1971

Code	Product	Unit of measure	Year	Total	January	February	March	April	May	June	July	August	September	October	November	December
2813300	Acetylene	mil.cu.ft.	1972	11,568	1,021	1,008	1,005	925	868	969	932	961	912	984	993	[illegible]
			1971	r13,349	957	1,029	831	1,088	1,052	1,025	1,020	1,036	1,019	1,086	1,118	1,068
	Produced for pipeline shipment, excluding that produced to be compressed	....do....	1972	5,738	503	491	492	458	440	497	479	491	436	477	475	499
			1971	r6,185	436	474	361	623	551	500	515	530	508	566	567	574
	Produced for compression, including cylinder and pipeline	....do....	1972	1,507	128	136	141	124	127	121	103	120	116	135	131	125
			1971	r1,515	127	133	144	131	124	122	111	116	122	127	129	130
	Produced for consumption in this plant	....do....	1972	4,323	400	378	372	343	301	351	350	350	360	372	377	369
			1971	4,649	394	423	328	334	377	403	394	390	391	393	422	402
2813415	Argon, high purity, total	....do....	1972	3,804	282	272	316	296	328	323	318	301	318	352	353	345
			1971	r3,048	225	228	267	241	256	233	258	228	259	289	275	289
	Produced for cylinder and bulk delivery shipment	....do....	1972	3,804	282	272	316	296	328	323	318	301	318	352	353	345
			1971	r3,048	225	228	267	241	256	233	258	228	259	289	275	289
	Carbon dioxide, total	Short tons	1972	1,481,287	104,612	98,523	132,207	118,088	134,222	138,451	132,550	139,886	132,148	127,789	118,933	105,896
			1971	r1,344,026	98,756	r98,285	102,804	111,235	110,484	119,018	125,206	126,771	118,593	114,759	110,379	104,748
2813311	Liquid and gas	....do....	1972	1,174,748	85,167	74,678	107,012	92,331	106,629	108,792	101,775	109,330	103,875	101,385	97,937	84,917
			1971	r1,027,327	77,237	79,073	80,911	85,389	82,905	89,035	92,000	92,634	88,906	86,620	85,646	90,651
2813321	Solid (dry ice)	....do....	1972	306,539	19,445	21,845	25,195	25,737	28,593	29,659	30,775	30,558	28,273	26,404	20,996	18,059
			1971	r316,699	19,519	19,212	21,863	25,446	27,579	29,983	33,206	34,137	29,687	28,139	24,733	22,795
2813[illegible]	Hydrogen, total	mil.cu.ft.	1972	58,890	4,791	4,804	4,972	4,731	5,118	4,887	4,949	4,686	4,973	5,043	4,955	4,941
			1971	r55,681	4,421	4,221	4,701	4,638	4,698	4,633	4,660	4,689	4,382	5,176	4,681	4,791
	Produced for cylinder and bulk delivery shipment	....do....	1972	5,463	454	432	505	382	504	486	470	454	453	462	501	359
	Liquid produced for [illegible] up to gas	....do....	1971	r5,304	414	404	458	498	487	465	414	450	392	442	462	517
	Produced for pipeline shipment	....do....	1972	12,834	1,015	996	1,184	998	1,186	1,048	979	1,008	1,139	1,088	1,045	1,148
	Liquid produced for government use	....do....	1971	r12,330	1,084	938	1,184	1,021	1,121	1,004	1,008	1,004	749	1,279	952	1,015
	Produced for consumption in this plant	....do....	1972	40,593	3,322	3,376	3,303	3,350	3,428	3,353	3,800	3,224	3,361	3,493	3,409	3,474
			1971	r38,047	2,953	2,879	3,058	3,119	3,090	3,164	3,237	3,235	3,241	3,455	3,287	3,349
2813440	Nitrogen, total	....do....	1972	193,540	15,118	14,804	15,899	14,976	15,936	15,994	16,411	16,697	16,302	17,260	16,827	17,316
			1971	r168,040	13,594	12,057	14,469	13,736	14,407	14,134	13,894	13,729	13,741	14,650	14,192	14,537
	Gas:															
	Produced for cylinder and bulk delivery shipment	....do....	1972	771	49	66	72	73	75	73	89	59	48	59	69	69
			1971	r635	42	62	59	65	54	59	52	33	28	53	57	67
	Produced for pipeline shipment	....do....	1972	112,239	9,005	8,559	9,210	8,798	9,189	9,150	9,311	9,640	9,421	9,944	9,866	10,166
			1971	r94,238	7,907	7,521	8,226	7,974	8,140	8,007	7,686	7,370	7,453	7,817	7,840	8,317
	Produced for consumption in this plant	....do....	1972	14,950	1,110	1,243	1,252	1,135	1,216	1,164	1,239	1,290	1,210	1,333	1,330	1,125
			1971	r13,877	1,242	1,076	1,254	1,040	1,183	1,119	1,156	1,204	1,123	1,201	1,173	1,178

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Table 8.--PRIMARY PRODUCTION OF SPECIFIED INDUSTRIAL GASES, BY MONTHS: 1972 AND 1971--Continued

Code	Product	Unit of measure	Year	Total	January	February	March	April	May	June	July	August	September	October	November	December
	Nitrogen--Continued															
	Gas:															
	Produced for cylinder and bulk delivery	mil.cu.ft.	1972	58,951	4,393	4,309	4,757	4,435	4,949	5,033	5,285	5,116	5,139	5,078	5,015	5,049
			1971	53,183	3,877	3,816	4,476	4,191	4,569	4,446	4,603	4,601	4,630	5,029	4,514	4,396
	Produced for bulk shipment to pipelines or to other air separation plants	do.	1972	5,095	466	465	492	430	380	411	382	459	362	422	417	409
			1971	r4,319	417	375	347	362	303	312	315	361	364	389	368	406
	Produced for consumption in this plant	do.	1972	1,534	95	129	116	107	127	163	135	133	122	121	130	153
			1971	1,688	109	107	107	104	135	161	142	169	144	161	145	173
2815	Oxygen, total	do.	1972	353,190	27,102	26,510	28,773	28,879	30,085	29,903	20,014	29,061	29,269	31,796	30,[illegible]	32,005
			1971	319,171	28,522	27,588	29,[illegible]	28,630	29,602	26,714	26,408	21,603	23,743	25,037	[illegible]	20,292
	Gas:															
	Produced for cylinder and bulk delivery shipment	do.	1972	530	41	38	40	41	41	41	36	40	36	44	55	51
			1971	r499	21	27	41	48	46	41	48	38	40	43	55	92
	Produced for pipeline shipment	do.	1972	246,903	18,223	18,206	19,6[illegible]	20,245	21,162	20,[illegible]	20,439	20,822	20,522	22,205	[illegible]	22,457
			1971	r218,176	19,654	18,916	21,344	19,951	20,748	18,535	18,176	13,590	15,458	17,029	16,811	17,575
	Produced for consumption in this plant	do.	1972	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
			1971	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	Liquid:															
	Produced for cylinder and bulk delivery shipment	do.	1972	43,943	3,248	3,340	3,554	3,420	3,774	3,555	3,400	3,403	3,639	4,426	3,980	4,000
			1971	r40,559	3,138	3,089	3,708	3,481	3,450	3,087	3,406	3,126	3,416	3,752	3,321	3,032
	Produced for bulk shipment to pipelines or to other air separation plants	do.	1972	10,275	656	824	903	928	848	855	891	904	863	759	824	829
			1971	r9,637	895	1,089	1,041	995	929	990	670	587	686	547	385	546
	Produced for consumption in this plant	do.	1972	[2]51,479	4,284	4,193	4,481	4,202	4,259	4,473	4,248	3,895	4,209	4,342	4,428	4,525
			1971	[2]50,300	4,721	4,457	3,777	4,157	4,489	4,171	4,108	4,276	4,127	3,870	4,097	4,167

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[1] Data for oxygen (gas), produced for consumption in this plant, combined with data for oxygen (liquid), produced for consumption in this plant, to avoid disclosing figures for individual companies.

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Table 9.—NUMBER OF ESTABLISHMENTS REPORTING THE PRODUCTION OF SELECTED INDUSTRIAL GASES, BY STATE: 1972

State	Acetylene 2813200	Carbon dioxide			Argon (refined) 2813415	Hydrogen 2813420	Nitrogen 2813440	Oxygen 2813450	Nitrous oxide 2813471
		Total[1] 28133	Liquid or gas[2] 2813311	Solid 2813331					
UNITED STATES, TOTAL	206	59	46	34	52	122	139	117	4
New England	6	1	-	1	1	3	6	5	-
Maine	-	-	-	-	-	1	-	1	-
New Hampshire	-	-	-	-	-	-	-	-	-
Vermont	-	-	-	-	-	-	-	-	-
Massachusetts	3	1	-	-	-	-	1	-	-
Rhode Island	1	-	-	1	1	1	4	3	-
Connecticut	2	-	-	-	-	-	1	-	-
Middle Atlantic	20	4	2	2	6	15	16	16	-
New York	6	2	2	-	1	4	5	4	-
New Jersey	4	1	0	1	2	8	6	5	-
Pennsylvania	10	1	-	1	3	3	5	7	-
East North Central	37	6	4	4	14	28	29	25	1
Ohio	14	3	2	3	6	7	6	7	1
Indiana	6	1	1	-	2	3	3	3	-
Illinois	5	1	-	1	3	12	12	7	-
Michigan	8	-	-	-	3	6	6	7	-
Wisconsin	4	1	1	-	-	-	2	1	-
West North Central	17	10	8	5	-	4	7	6	1
Minnesota	3	2	1	1	-	-	1	2	-
Iowa	3	4	4	2	-	-	-	-	-
Missouri	2	2	1	1	-	2	3	2	1
North Dakota	-	-	-	-	-	-	-	-	-
South Dakota	3	-	-	-	-	-	-	-	-
Nebraska	1	-	-	-	-	-	1	2	-
Kansas	5	2	2	1	-	1	-	-	-
South Atlantic	27	7	6	4	8	15	23	16	1
Delaware	-	-	-	-	1	4	2	2	-
Maryland	2	-	-	-	1	-	3	2	-
District of Columbia	-	-	-	-	-	-	-	-	-
Virginia	4	1	1	1	1	2	3	2	-
West Virginia	4	1	1	1	2	5	5	5	-
North Carolina	4	1	1	-	1	1	3	1	-
South Carolina	1	-	-	-	-	-	3	1	-
Georgia	4	1	1	1	1	2	2	1	-
Florida	8	3	2	1	1	1	2	2	-
East South Central	15	3	3	1	4	16	17	12	-
Kentucky	2	1	1	-	-	4	5	3	-
Tennessee	8	2	2	1	2	8	7	4	-
Alabama	4	-	-	-	2	3	4	4	-
Mississippi	1	-	-	-	-	1	1	1	-
West South Central	43	11	10	4	9	24	18	17	-
Arkansas	3	-	-	-	1	-	1	1	-
Louisiana	8	4	3	2	3	6	6	6	-
Oklahoma	3	-	-	-	-	1	-	-	-
Texas	30	7	7	2	5	17	11	10	-
Mountain	18	6	4	6	2	2	2	2	-
Montana	3	-	-	-	-	-	1	1	-
Idaho	2	-	-	-	-	-	-	-	-
Wyoming	1	-	-	-	-	-	-	-	-
Colorado	5	2	1	2	1	1	2	2	-
New Mexico	2	2	2	2	-	-	-	-	-
Arizona	1	-	-	-	-	-	2	2	-
Utah	3	2	1	2	1	1	3	-	-
Nevada	1	-	-	-	-	-	-	-	-
Pacific	23	11	9	7	8	15	15	12	1
Washington	5	2	2	2	1	2	3	2	-
Oregon	4	-	-	-	1	1	1	1	-
California	11	6	4	4	6	10	9	7	1
Alaska	1	-	-	-	-	-	-	-	-
Hawaii	2	3	3	1	-	2	2	2	-

-Represents zero.
[1]Unduplicated.
[2]Excludes plants converting entire production to solid.

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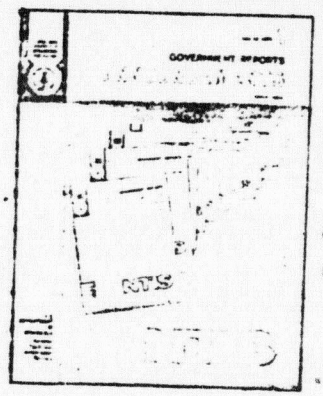

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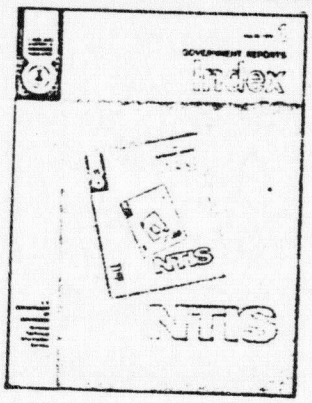

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Annual Statistical Report

AMERICAN IRON AND STEEL INSTITUTE

1972

AMERICAN IRON AND STEEL INSTITUTE
1000 16TH STREET, N. W., WASHINGTON, D. C. 20036

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BOC RX 56 C

BASIC MATERIALS
Electric Power
Oxygen

TABLE 50—CONSUMPTION OF ELECTRIC POWER BY THE IRON AND STEEL INDUSTRY

(Millions of kilowatt hours)

Years	Generated	Purchased	Total
1972	12,198	39,358	51,556
1971	11,164	37,481	48,645
1970	11,749	37,833	49,582
1969	11,702	36,691	48,393
1968	12,685	33,470	46,155

Similar data not available prior to 1943.

TABLE 51—CONSUMPTION OF OXYGEN BY THE IRON AND STEEL INDUSTRY

(Millions of cubic feet in gaseous form)

	1972	1971	1970	1969	1968
Purchased (a)	208,160	180,386	192,966	189,317	166,507
Produced (b)	25,644	26,899	26,641	25,243	15,189
Total	233,804	207,285	219,607	214,560	181,696
Consumption by Use:					
Conditioning	18,228	16,121	15,942	17,081	17,464
Flame preparation	1,592	1,661	2,808	1,972	2,043
Other burning and welding	3,733	3,885	3,609	3,840	2,376
Blast furnaces	16,512	13,311	13,528	9,078	6,659
Steelmaking:					
Open hearth	43,396	38,664	51,610	53,712	55,147
Basic oxygen process	138,067	121,207	120,336	114,175	86,650
Electric *	8,076	6,916	5,630	4,891	4,764
Total Steelmaking	189,528	166,687	177,616	177,778	146,761
Maintenance and construction	1,126	988	970	728	497
All other	4,085	4,642	5,136	4,083	5,896
TOTAL	233,804	207,285	219,607	214,560	181,696

* Includes Bessemer in 1968 and prior years.
(a) Purchased from vendors with facilities in or adjacent to plant or facilities located away from plant.
(b) Produced on companies own facilities or leased facilities.
NOTE: Oxygen consumed in liquid form was reduced to its gaseous equivalent in these statistics.
Similar data not available prior to 1966.

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BOC Rx 57A

GROUP OBJECTIVES : PART 2

THE FUTURE DEVELOPMENT OF BOC AS AN INTERNATIONAL CONCERN

1 INTRODUCTION - BOC TODAY

BOC today operates in 24 countries on five out of six continents: where £46 million or 37% of total Group capital is employed; and whence £7 million or 70% of total Group profits accrued in 1967. It is therefore pardonable to conclude that BOC is an international concern already. And when one compares BOC to others in our industry one finds that we operate in more countries than anyone except L'AL and AGA - an unusual feature of this industry being the comparative absence of the Americans - so again one could be excused for concluding that not only are we international but also that we are more so than most.

But we know this is not true and that what BOC really is today is a British company which has over the years started up or acquired a number of associates or subsidiaries overseas, most of which are today flourishing; all until recently in the Commonwealth; all until Italy, English speaking; mostly small units in small countries, comparatively underdeveloped. And we have been notably absent from USA, continental Europe and Japan, between them containing over 50% of the world's industrial production and holding (with UK) practically a monopoly of the non-communist world's advanced technology.

The recent appointment of CE Europe and the intention to open an office in Japan for far more than mere export co-ordination (both these come up later in the BOC International agenda) are indications of a desire to move away from this situation, but we have not still decided what we really want to become.

Is it a truly international business corporation which seeks an entrepreneurial role in any part of the world where it identifies relevant opportunities and adequate incentive, or is it something else and less? Whatever it is, positive effort to strengthen and widen our overseas operations is inherent in acceptance of the 15% turnover growth target in Group objectives and the chances of continued independence and breadth of geographical activity are probably inter-related.

Group Objectives puts as objective number (iii): "to remain a wholly independent concern with an increasingly international outlook" but wisely remains deliberately vague on what this really means.

2 PARAMETERS DEFINING BOC'S SCOPE TO BECOME INCREASINGLY INTERNATIONAL

What it ought to mean is dictated by the practical limitations of BOC's present and future capabilities and the international scope of the various product/process environments in which we operate.

To develop internationally we need, inter alia:

i) technological and/or marketing leadership (or at least eminence) in our selected fields of effort;

ii) adequate financial resources to exploit opportunity;

iii) international outlook in management fostered through

iv) good communications;

v) understanding of different socio/economic/political environments selected for operating units;

vi) products suitable for all markets selected and/or capable of local manufacture;

vii) successful home operations - the foundation of Group/corporate confidence.

Examining these:

i) The first statement of Group objectives. PLS/JMD/23 said: "to move towards becoming a fully international company with special reference to technological achievement". We are good at starting and building up to meet market demand at all levels of sophistication an industrial gas business. This is at present our main strength. It is one we can still exploit in any of the less developed parts of the world where we would not be too late on the ground, and even in parts at least of continental Europe. But we have not got much to exploit in North America, and Japan is doubtful.

Between us (BOC, CIG, etc) we are probably as good as anyone at designing, making and marketing oxy-acetylene products and fairly conventional electric welding equipment and consumables, but we do not command any technological heights here: so opportunity for development must probably be territorially in less developed countries, and again possibly Europe.

How far our newer ventures equip us with new opportunity to develop in the more advanced countries inside and outside our present area of

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2 continued

operations and how far we must seek to change our present business mix to give us the right technological/marketing strengths for this purpose? This is a fundamental question to which we have barely started to look for an answer and until we know more about it we cannot say how international we can get.

ii) This is dealt with separately (by PSR).

iii) Can we expect an international outlook in management unless it is self-evident that exciting international opportunity exists for the product/process area in which they are working? This is a chicken/egg situation which can be resolved mostly by the development of profit responsibility and by devolvement down the management line in every PAC* where this applies, but also by

iv) good communications, which is the subject of separate discussion.

v) We are fairly good at this.

vi) Should follow from (iii) and (iv).

vii) This is coming.

Thus our greatest gap is in (i) above. We have no major latent talents waiting unexploited to take us surging into Japan, Europe or USA or to double our activity in Australia, South Africa or Canada - but the opportunities we do have now will be better identified and quantified once the proposed steps towards the implementation of Group objectives are stated.

3 THE REALISTIC POSSIBILITIES IN THE NEXT FIVE TO TEN YEARS

Without some narrowing of the gaps which will be found to exist, we cannot expect to be much more successful in the developed countries than we are today. Some geographical expansion will be possible by the use of our intermediate technologies, even without some closing of the gap which must be assumed to happen. Given this assumption we should recognize for at least the next five to ten years that BOC Group is:

> A group of companies with a British parent as majority shareholder, which seeks through its appropriate PACs to exploit any suitable operating investment opportunity in any part of the world alone, with local or foreign partners, or by way of licence/management contracts, provided -

i) there are adequate financial incentives;

*Profit accountable centres

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3 continued

ii) it is above a minimum size to be defined according to PAC concerned;

iii) it is sufficiently close to one or more of present Group skills to be synergetic;

iv) there is sufficient management talent locally available to back whatever expatriate effort is required and available.

In the meanwhile all the options on whether, when and how to become international, multi-national, etc in the financial sense should be kept open.

Long before it is necessary to consider this we should have become less nationalistic in our attitudes to management succession, particularly near the top, as a step towards greater internationalism.

4 THE STRUCTURE OF THE OVERSEAS GROUP
ITS RELATION TO BOC UK GROUP HEADQUARTERS
THE ROLE OF OVERSEAS DIVISION

1 In a so-called "truly international corporation" the usual concept is of an indefinite number of operating units, all 100% owned by the parent, whose shares are available to investors in all the countries in which the corporation operates and in which research and development, production and the serving of individual markets are all organised in accordance with a central plan. BOC relationship with overseas companies (or at least its larger ones) is at the opposite extreme. Our position has been described as acting "rather as the manager of a specialized investment trust who seeks to provide some encouragement and service to the companies owned; particularly services or technical advice on the specialist businesses - industrial gases above all". At the same time, however, we exercise more detailed control on some of our smaller companies (eg in Far East) than over a UK trading division, though not in order to ensure implementation of any centrally recognized plan.

This situation has developed from lack of sufficient effort by UK to provide more positive guidance in recent years, over-absorption in UK affairs by top management reducing communications to tenuous proportions and the simultaneous emergence of the major overseas companies as prime contributors to Group profits.

This situation cannot now be reversed or the trend changed by the mere taking of a decision so to do. It must be preceded by:

i) the establishment of Group objectives so all concerned know BOC Group seeks to control its destiny and that each operating unit has a defined and agreed role to play therein;

BOC RK 5/7E

4 continued

ii) the image of business in UK - both for BOC and the economy as a whole;

iii) vastly improved communications /BOC (I) and CE Overseas/;

iv) better search for opportunity in new business areas headed by UK;

v) improved central services from UK, particularly Finance and Overseas.

Assuming the conditions exist to enable a changed relationship to be developed, suggested that acceptance of the following is required:

1) All OACs are PACs in the Group with a prime responsibility upon board and chief executive thereof to build the business according to a long-term business plan agreed by Group Board as that unit's optimum contribution to Group profit performance and growth (and annually within budget agreed by Group Board).

2) Directors and chief executive of OACs are entitled to know exactly what BOC as majority shareholder expects of them. This should be provided in writing.

3) Although 1) is the prime responsibility of OAC boards and chief executives, it is not their only responsibility. BOC accepts the multi-national or geocentric approach, not the centrally controlled American-type international control. This is touched on in objective (vi).

4) Active participation by BOC Overseas Division through CE or DCE as representatives of BOC corporate services in individual OAC objective setting, planning and search for growth.

5) Agreement with BOC through Overseas Division on development of business strategy, coupled in the case of many OACs with loosening of present close control on day-to-day local tactics.

6) That chief executive of each company is responsible to his board for all above.

If this concept is accepted, Overseas Division becomes decreasingly on-the-spot support for trouble-shooting with UK trading divisions and HH services, plus technical/commercial adviser on comparatively routine matters to the smaller companies (although unless other arrangements are made, this requirement will remain) and increasingly an essential link in the planning and strategy making of OAC top management, with a parallel role for "neutral" territories, but where full business development responsibility is with CE Overseas.

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4 continued

Thus CE Overseas is at the same time an adviser to the chief executive of each OAC and his link with JMDs and Chairman of BOC UK for policy clearance wherever required for any matter.

The sort of advice required will vary widely, from decisions on plant size, price structure, local manufacture, organisation/personnel policies for the small company, to generally only major new investment decisions, opportunity identification, organization structure (with initiative desirably sometimes from this end) in the case of the larger ones.

Overseas Division must be staffed to cope with this range of requirements until/unless some regionalization takes place whereby the major company in an area gives routine management/technical/marketing/planning support to the smaller units in its vicinity.

This concept may well be worth developing but only on the understanding that the purpose would be to build up groups of operating units working to one overall Group policy. The concept of three or four strong but unrelated confederations working to the policy requirements of the total parent would be unacceptable, but nevertheless an anticipatable development of the present loose federalism. — — — — — — in the EEC?

But the trend can only develop fitfully, due to political barriers and personal factors. Nevertheless it should be encouraged as individual opportunity permits.

5 THE ROUTES TO EXPANSION OF BOC's OVERSEAS ACTIVITIES

The 8-year projection made in September 1967 of sales and profit performance of the overseas group showed an overall annual growth rate of 6.5% and an overall pre-tax return on capital in the period of never less than 19 % or more than 21.5%. It is probable that another projection done this year, and in line with the more dynamic approach to be discussed later, will throw up different, and hopefully better, figures. But there is no doubt that there will be a growth rate gap and that therefore there must be for the first time a positive search for profitable growth at a rate substantially faster than the growth of the businesses in which we now operate (and widely understood by management in the group so to be).

The search should take place in the following areas. The order in which these are set out indicates the probable comparative ease with which opportunity, once identified, can be exploited therein, but is not intended to indicate that search should take place in the sequential order set down: it should be consciously attempted in all areas simultaneously and continuously, but when it comes to selection of where available resources should be concentrated the following probably is the order of preference:

BOC RX37G

5 continued

1) Fuller exploitation of existing business areas in existing territories by increasing market share, selective filling out of product ranges, expansion of market areas, improved pricing policies leading to better margins, etc etc.

2) Expansion into new synergetic activities in existing territories, particularly where real opportunity for quick growth exists.

3) Exploitation of well-established skills in new territories with preference for those with stable political/economic conditions, but not ruling out those with less so if immediate probable level of profitability sets off risk involved.

4) Development of synergetic activities in new territories usually, but not necessarily exclusively, after acquisition of necessary experience in an existing operating unit.

The world is unfortunately divisible into developed and underdeveloped territories. It should be easier to find opportunity for effort in 1), 2) and 4) above in developed countries, and in 3) in underdeveloped territories, and it will probably be desirable to devote most effort to the former. At the same time the easiest skills to exploit in new territories will be those referred to in 2).

It will thus be necessary to draw up some sort of league table of where resources should most desirably be concentrated. This may indicate that some countries where we already operate will be so far down the list that we should limit our objectives therein and the resources to be made available to meet them. However this is done, it is likely that Australia, Canada, Europe, Japan, South Africa and USA will feature at the top of the list.

A first cockany of the factors to be considered and a resultant league table will be presented for discussion at BOC International.

It has already been mentioned that routes to growth lie through both going it alone and joint ventures. The latter will feature more prominently in our future considerations, particularly in new synergetic activities and in all new activities in some new territories, eg Japan, Iran, South-East Asia, Latin America. Indeed, in some countries it will be the only way in.

This will add to the list of problems associated with trading in underdeveloped countries, and thus to the danger of BOC's management and technical resources becoming unduly tied up in often comparatively small,

BOC Rx 574

5 continued

and more than often remote ventures. It may well be time to look positively to the larger OACs to share in the responsibility for seeking out, investing in, and subsequently supervising suitable new operations close to their home ground. CIG and AFROX have already invested outside their frontiers in businesses in which their "intermediate technology" has obvious potential, but is it not now time for that search to become more positive and coordinated.

6 THE FORMAL APPROACH TO PLANNING IN OVERSEAS GROUP FOR ACHIEVEMENT OF GROUP OBJECTIVES

This is dealt with in a separate paper.

7 Two aspects are deliberately omitted from this paper:

i) Availability of adequate financial resources to meet the requirements of growth. This will be dealt with separately by CE Finance:

ii) The contribution of Exports from individual Group operating companies to the increased internationalization of Group activity.

R. C. HESKETH-JONES

RCHJ/JET
16.5.68

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PLS (69) 7

12th September 1969

BOC RX 60-A

BOC AND THE USA - A PAPER FOR DISCUSSION

1 Incentives and Obstacles

2 A Possible Policy

3 Canada as a Base?

4 Choice of Industrial Sectors

5 The Group's Strengths

6 Practical Steps

APPENDIX

A Key Statistics 1968

B Selected Points from a Recent Publication - The International Corporation

C An International Strategy for the Group - Some Aspects Discussed Afresh

D The Engineering Industries in North America - Europe - Japan 1966-7

E A Note on Statham

This paper has been prepared as basis for discussion at BOCI V, 29th September - 2nd October 1969.

Mr Perkins has seen the paper in draft and indicated his acceptance of it as basis for discussion. He has certain comments to add, particularly on choice of industrial sector; he intends to make them at the meeting and they are not incorporated now.

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FILE

12th September 1969

BOC AND THE USA - A PAPER FOR DISCUSSION

1 Incentives and Obstacles

The Group's participation in businesses in USA is very small. BOVI Inc. is the only wholly-owned operation. Reasons for aiming at substantial extension :-

(1) The USA is the largest, most advanced and most highly productive industrial area in the world with its Gross National Product (GNP) some 8 times that of the UK and 2½ times the total of the six EEC member countries. GNP per head at $4,290 is the highest of any large country. Most industries in which technology ranks as "advanced" are dominated internationally by American firms. Output per employee in the American engineering industries is twice to three times as high as in other advanced industrial countries.

(2) There must be competition with American-based international corporations on their home ground, at least in certain selected businesses, if the Group is to be confident of survival internationally against American-based firms. The Group must have some direct exposure to the American industrial and technical climate.

(3) German firms are likely, increasingly, to invest heavily in the USA over the next few years; this export of capital will be a reflection of German trade surplus. BOC could be at some world-wide disadvantage against (eg) Linde AG, Messer-Griesheim and Draeger if they are extending into the USA and BOC is not. L'Air Liquide, despite the adverse French balance of payments, are already expanding in the USA.

Nevertheless, the difficulties will be great :-

(1) [illegible] multinationality [illegible] gives the local firms an advantage. The BOC Group's first phase of participation must be seen as something that can only hope to succeed in a small or specialised sector - one that is changing fast so that there is opportunity for newcomers. It is unlikely that an effective strategy could be built around an objective of becoming a major American firm in any wide range of gases and welding products; although possibility of participation in limited sectors need not be excluded at this early stage of reviewing the problem.

BOC Ex 60-C

(5) There is a problem of finding dollar finance, which Central Finance is studying separately. Moreover it is unlikely that a proposition would be found which, from the outset, would meet BOC's normal requirements for return on new investment.

(6) Entry by direct venture, with virtually no existing base from which to build, is unlikely to be practicable.

(7) Entry by acquisition would be difficult; financial justification would not be easy since the P/E ratios of successful small companies can be as high as 30 or more. Average P/E ratios, however, differ little from the UK and there is just the possibility that BOC could find a depressed company to which it would be offering a life-belt. More generally, American firms are usually unwilling to be acquired by non-American owners; EHVI has made attempts to secure a broader base in USA and its experience supports this point.

2 A Possible Policy

Despite the very large size of markets in the USA, the main purpose of a series of BOC ventures over the next, say, five to ten years would be commercial, managerial and technical "exposure" rather than for the sake of the business itself. Some kind of joint venture, or series of joint ventures, could give "exposure" if direct entry and acquisition are blocked. The way into the USA for the BOC Group might be by some form of association with an existing firm which would have a specification broadly like this :-

a much smaller than BOC; but growing fast enough to be aware of the needs for "big company" strengths that BOC could bring through an association.

b successfully participating in some business within the definition of BOC's existing and intended corporate strategies. A business in which the American environment gives some distinct, identified, advantage that BOC can tap for exploitation in the UK, Europe and elsewhere.

c no operations on any substantial scale outside the USA, so that BOC could immediately give the advantage of international access.

d not capital intensive and not a business in which it is intrinsically disadvantageous to be small, at least initially.

BOC's association would probably have to begin on the basis of a 50% or even a minority shareholding, because it is unlikely that the management of a company worth buying into would let BOC have a majority position, and BOC would not object to win control of an American quoted company in face of opposition from its Board. Nevertheless, the long term intention would be a majority position - to be won by making a visibly dominant contribution over a period of years to the venture's success, and by meticulous attention to cordial and constructive relationships. The partner would come to have a sense of achieving things with BOC that he could not achieve alone, in time he would see himself as a member of the Group.

An added incentive both for BOC and the partner might be the possibility to manufacture outside the USA some labour-intensive article at present made only in the USA, and so obtain the benefits of lower labour costs. Or there may be cases where there are advantages in building up an international product development team to work in UK or Europe, but aiming at the USA and world-wide markets. There would have to be the closest evaluation, however; in some instances the American labour cost disadvantages will be offset by scale and other factors.

3 Canada as a Base?

A question that might be asked is whether Canox might not serve adequately as base for expansion into the USA or indeed whether growth in Canada could be seen as a satisfactory substitute. The Canadian GNP is one-fourteenth of that of the USA. Canadian GNP per head at $2,920 is some 68% of the USA figure and it is arguable that it is as high as this only because of geographical contiguity. Thus, while Canox has an important and valuable place as base for the BOC Group in North America, its existence and its further development cannot be seen as substitute for Group business development policies for the USA.

4 Choice of Industrial Sectors

What industrial sectors should be seen as having priority for study as the way into the USA for BOC? Following is suggested as a first list :-

(i) Medical hardware - possibly instrumentation - and services

(ii) Distribution, as a service, of industrial goods (possibly including distributorship of gases and welding products)

(iii) Adhesives or other speciality chemicals

(iv) Food services - with special reference to transport and storage (cross-link to point ii above) and to "convenience" foods

This list may call for revision later, with incorporation or substitution of further items from the Group's preferred list of business "themes" for growth - see other current or impending papers.

Meanwhile, there are two specific cases which could be regarded as available for study :-

Harris Calorific : where BOC already has a majority stake, and who handle BOC medical equipment.

Statham Instruments Inc. : a leading manufacturer of transducers (devices for sensing pressures and temperatures) with markets growing now in medical and process-control uses rather than, as formerly, defence and space. BOC has had some recent contact with them.

5 The Group's Strengths

Choice of industrial sectors and decisions on particular venture opportunities must be linked to some analysis of :-

BOC EX 60-E

(i) the Group's strengths - the basis for the special contribution that it can offer an American partner;

(ii) the Group's ambitions as an international concern and especially the reasoning that underlies the Group's aim of becoming increasingly international.

These tend to be difficult topics because they are intangible; nevertheless they are important and relevant. Appendix C is an attempt to provide some added light.

6 Practical Steps

Practical steps now proposed are :-

i to conduct a programme of desk research at Hammersmith, using directories, press etc. on specific business opportunities - what kinds of firms exist in selected business areas and size brackets, what are their records of profitability and growth, to what extent and on what terms they have been involved in the merger movement;

ii to talk on an informal and preliminary basis with a very few, possibly only two, American business brokers. These discussions, in conjunction with our own desk study under 'i', should show whether and how far we need to enlist their services.

Despite the general tone of the present paper, the small possibility remains that an outright acquisition might follow. Finance might be found, as in the well-known recent instances of acquisitions by BP and Plessey, by vendors' readiness to accept a series of instalments from future cash flows of the acquired enterprise. But the more promising avenue would seem to be minority or 50% participation initially.

In any event a formidable volume of work will be involved. One might reasonably predict that the number of propositions to be screened at desk stage over a period of one or two years would run into some hundreds, and that those cases to involve at least some preliminary negotiations would run into some dozens.

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ANNEXURE A

KEY STATISTICS 1963

	USA	Canada	UK	EEC	Japan
Population (million)	201	20.8	55.5	185*	101
GNP (US $ billion)	861	60.7	101.8	346*	117.5*
Per Capita GNP (US $)	4,280	2,920	1,830	1,870*	1,170*
Exports (fob) (US $ billion)	34.7	13.1	15.3	64.3	13.0
Imports (cif) (US $ billion)	35.5	12.5	19.0	62.0	13.0
Steel production (mill.ingot tons)	117.0	8.7*	25.9	97.0	65.6
Index of industrial production (1963 = 100)	133	137	117	128	191

* 1967

Sources : IMF, OECD, UN and EEC publications

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BOC RX 60-6

Selected Points from a
Recent Publication

THE INTERNATIONAL CORPORATION

The International Chamber of Commerce, at its 22nd Congress (held a few weeks ago in Istanbul), had as its main subject "The International Corporation". A 200-page "Background Report" was prepared for the meeting; it includes 75 pages of tables and a brief "Epilogue" entitled " On Rights and Responsibilities". We have it in the office together with a 20-page pamphlet prepared after the Congress to provide "definitions and conclusions" on "The Role, Rights and Responsibilities of the International Corporation".

The variety of topics covered can be indicated by listing the chapter headings of the "Background Report" : -

Some Statistics
The International Corporation and the Developing Countries
The Transfer of Technology
Method of Operation of the International Corporation
The Legal Background
The Financial Background
The National Response

To some large extent the author acts both as reporter and critic of earlier published work, - including Reddaway and many other sources.

To select a few from the great number of points covered :-

1 (pp 9-11). The international corporation is neither new nor predominantly American based ("le défi" is international rather than American).

2 (pp 15-16). Author does not share the view that "... the world's economy of the future will be dominated by 300 or 400 super international corporations ---- (and that) --- a global strategy must be adopted to join this... group". He does see the basis for the view: if large corporations succeed in growing at, say, 7% pa but GNP grows only at 3%-4% pa, then share of total held by the large firms must grow. But he observes :-

a In the USA, "... where the integration process has gone on longest ---- relative division of output between small and large companies ---- has not really changed radically since the 1930's"

b A major motive for investing heavily and internationally is that a company has "--- some form of technological advantage"; however, such an advantage cannot last for ever and must be replaced by "--- standardised production, involving numerous competitors---"

Observed that an English author of some 70 years ago "--- saw the giant and rapidly growing production of pig iron as the source of America's strength. This early talisman, forerunner of the computer, is today within the capability of any country ---".

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3 (p 17)In the USA, where "--- modern industrial integration has been ... growth of big corporations, bringing "--- efficiencies and economic benefits", has not meant the death of the "--- small and local business: which now "--- flourishes --- as supplier, innovator and independent seller of services; indeed, as once new-product technology gives way to standardisation, local business competes successfully in manufacture as well".

4 (p 18). Within the developed world, where the "--- vast bulk of international corporate activity takes place ---", advanced technological and managerial skills are spread by the international firms and economic integration (EEC, EFTA, LAFTA, "Kennedy Round") aids the process. In the developing countries "--- the international corporation is an important factor in economic development --- it brings technology in the broadest sense --".

5 (p 24) Industrial concentration marked in terms of foreign operations : -

Industries with :-

Much international investments.	Moderate	Little or None
Chemicals	Food	Steel
Pharmaceuticals	Tobacco	Ship-building
Fibres	Engineering	Aircraft
Oil		
Machinery (incl. vehicles)		
Electrical equipment		

6 (p 27) The "internationalisation" of Swedish industry is very high; between 1960 and 1965 the total amount of investment abroad by Swedish firms nearly doubled.

7 (p 27). The flow of investment abroad by American industry continues to rise, but at a declining rate of increase.

8 (pp. 33-4). Oil industry as a case-history: capital intensive ; fast growing; vertically integrated and international; new entrants in recent years: rate of return 30% in 1955 had fallen below 12% by 1967.

9 (p 38). Developing countries. Their internal market is so small that local manufacturers cannot attain world-competitive cost levels. Motives to establish are usually import-substitution with the "overspill" concept (an exportable margin) to follow. Many instances, but few successes.

10 (p 40). The "specialised production of components among countries, based on their comparative advantages---" is an alternative approach to internationalisation, notably adopted by some tractor, computer and electronic firms.

11 (pp 42-44). Questions of the advantages of local participation in the equity aired -whether at all, or majority, or minority.

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Case for 100% ownership where subsidiaries involved in component manufacture, otherwise there can be "intolerable" arguments about transfer prices. "Most nations often exhibit --- inconsistent ---- demands on the international corporations' ie if a Government limits the extent of parent company participation it is probably also limiting the incentives for the parent to transfer its supposedly superior technology.

12 (p 48). "The term 'transfer of technology' is an accepted short-hand for a fairly complex procedure ---- application of ideas - scientific and others - to the development of marketable products".

Among the subjects touched on in the remaining 100-odd pages are : -

i Nature of technological gaps.

ii Contribution of international firms in developing countries; some special reference to management training and research.

iii Motives that lead firms to invest abroad; references to licensing and cost of capital, tariff barriers.

iv Centralisation versus federation.

v Internationalism can start as a "side-show" yet predominate later. ("---- many more --- European corporations --- may be expected to enter the stream of internationalism--" p. 72).

vi Managerial mobility.

vii Anti-trust laws in USA and EEC.

viii Economic aspects of greater concentration; not all observers accept "conventional wisdom" on "the alleged virtues of size" (pp 94-5).

ix Tax burdens, tax-havens, obstacles to internationalisation of shareholdings. Specific recommendations given on tax changes which would bring about "-- more rational fiscal policies--" (pp 104-5).

x Case for unification of capital markets as and where practicable.

xi Place, as servant to industry, of the "increasingly" international financial institution ("The World Bond League" appears on p.116).

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xii The generally uneasy, or at best mixed, response of the nation - state to the international corporation. Economic criteria ("relatively rational" - p.121) tending to get jumbled with the non-economic and irrational.

xiii Some special account of experience in Canada, and in Japan.

HSR/MSW

25 July 1960

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APPENDIX C

20.6.68.

AN INTERNATIONAL STRATEGY FOR THE BOC GROUP - SOME ASPECTS DISCUSSED HEREIN

In the present phase of the Group's planning efforts, work is concentrated mainly on review of the types of business activity that the Group is in and seeks to be in; the aim is closer and well-reasoned identification of businesses. This emphasis on the question of "what" (what business areas) and coupled with it the question "where" does not debar partial re-opening as appropriate of the fundamental question "why" - the Group's philosophy, the basis for successful business strategies.

BOC intends to be an outstandingly successful international industrial organisation; the specific choice of business areas, although vastly important, is as much a matter of means as of ends.

Leaving aside some of its more controversial aspects, the published report summarised in Appendix B suggests that :

a Only a very few and exceptional firms can expect to succeed in doing the very thing that BOC aims to do, ie to grow over a really long term much faster than the typical industrial growth rate as a whole, which itself can differ but little from GNP growth rates (say usually 3½ to 5½ pa, exceptionally a point or so higher).

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b One way of achieving very fast growth could be to have some outstanding technological capability in a particular business and to exploit it internationally. The advanced or outstanding technology of today is likely to become everyone's technology tomorrow, so that sustained success requires a continual refreshing of the technological capability. For a great many firms, however well led, such a strategy would be impossible - it is necessary to be in the right place at the right time, and probably also to have some substantial technological heritage.

c For many firms, therefore, and BOC is probably one of them, the secret of outstanding success must lie somehow elsewhere - in, it might be said, its quality of management and organisation, its attitudes and methods of work. This does not exclude elements of technological capability; indeed some such elements are probably essential.

"Quality of management" can mean many different things; the following list is not exhaustive and there is some overlap within it :-

i An organisation which tries to be a sort of precision machine; tight financial reporting and requirements, yet a definite devolving of some responsibilities from the centre.

Examples General Motors
Some international oil companies
Philips.

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ii Outstanding marketing capability applied with fast international transmission of the applied skills; good as innovators; challengers of others in long entrenched positions (sometimes - AP perhaps an example - notably quick decision-making is a component of this strength). Often involves rather uncritical loyalties to the company or its brand names; this can be inimical to constructive problem-solving attitudes.

Examples Procter & Gamble
Air Products
Mars / Petfoods

iii Ability to build in some way on a strong technical competence; (ie a fine technical heritage is not enough by itself, high success calls for some element of special style or drive in management or organisation to be added)

Examples Boeing
Hoechst
APV
Rolls Royce

Example of a firm with the potential but not the realisation

Linde AG

iv Highly constructive problem-solving atmosphere within the firm; exceptional capability for business project teams

Examples Du Pont
BOC

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v Strength via sheer size with large force of management services at the centre; wide diversity geographically and (though perhaps less so) in product range.

Examples (both questionably successful) Union Carbide

Unilever

vi An organisation with much devolution to fully profit responsible entrepreneurs leading relatively small, flexible units - lean, agressive, often diverse. Nevertheless, bound together by some common link, often the financial strength of the group as a whole.

The "conglomerates", when successful, are of this class :-

Slater Walker

I T & T

What practical conclusions does this reasoning have for BCC?

First, since a strictly or predominantly technological capability seems unlikely ever to be BCC's principal source of enduring and above-average attainment, there is no particular case for a narrow product-range base. The Group's existing fairly wide diversity of products and services, even with some further widening to come, is acceptable.

Second, the major source of Group strength, and the main basis for its increasing internationalism,

BOC RX 60-0

should be seen as residing in some aspect of "quality" or "style" in management rather than in some particular capability in engineering, development or marketing. This is arguably to be welcomed, since the applicability of such strengths is more likely to be enduring in time and extendible geographically and industrially than with some primarily technological strength.

Third - and this is as much a suggestion as a conclusion - that the aspect to be selected should be a reinforcement of the existing major strength in the all-round competence of managers and their specialist advisers, and especially the capacity for creative teamwork.

This might mean policies aiming at all-round intensification of the Group's already considerable activities in management recruitment, development and training; and the adding of international dimensions to these activities.

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APPENDIX 2

THE FACTS ABOUT INVESTMENT IN
NORTH AMERICA - EUROPE - JAPAN: 1956-7

The 300-page report under this title,* recently published by the OECD (Paris), contains a mountain of statistics with analysis and [illegible]. It identifies gaps between American and non-American performance, and it gives Britain the unhappy distinction of having the poorest record of any large OECD country.

Key paragraphs on the first issue are :-

"170. Two particularly important facts which stand out from the data discussed above deserve special attention and, if possible, an explanation. Given a comparable level of technical know-how (2) and training in the main producer countries :

- the North American engineering industries' deliveries amount (in value) to about double those of the same industries in the other OECD zones, despite the fact that the latter employ nearly twice as many people, and
- this same North American sector's capital outlay, in terms of turnover, is about half that of the other Member countries together.

171. The apparent contradiction of these two facts excludes any attempt to explain it by the argument that the unit price of labour, which always has been and still is lower outside North America, would justify other countries' preferences for production of a labour-intensive rather than capital-intensive type. It therefore seems that the explanation of the difference between the relative levels of investment and their return (1) should be sought rather within the sector's structure and the demand it meets, and perhaps to a lesser degree (due to these structural differences) in the motives for investment."

"(2) With the possible exception of a few newspaper headline-making industries whose share in production is nevertheless not large.

(1) Which it should be repeated cannot be explained by the play of price disparities (on the contrary) nor by the somewhat arbitrary fixing of official exchange rates."

Report goes on to distinguish the three main motives for capital expenditure :-

i renewal after normal wear-and-tear,

ii to match increased demands,

iii for improvement of the product, and rationalisation;

and to assert, as broadly supportable by the statistics over the years, that :-

* Note that this is a document prepared within BOC in February 1960.

BOC RX 60-Q

- in the USA and Canada "... motive (iii) is never absent and, in fact, is predominant".

- in the US and (until 1958) Belgium it is mainly motive (i), "... it is difficult to discern much investment of type (iii)".

- in Germany type (ii) has predominated; the rate of production increase has slowed down since 1963 when labour shortages began to be felt.

- in Japan it is (iii) with (ii); "... rapid expansion has been accompanied ... by remarkable rationalisation".

- in Italy and Sweden "... rationalisation predominates but expansion of production is still appreciable".

On causes :-

"175. In view of the fairly similar level of technical know-how and training in the principal producer countries, and the fact that the trend of disparate returns is long-standing, it seems that the explanation of these disparities is to be found less in the attitude of management to capital outlay, or in the economic cycles, than in the basic differences of production structure and demand. In addition to these, but to a lesser degree, account must be taken of certain effects of governmental investment policies."

Hence the report goes on to discuss "Structure of Production" and then "Structure of the Market"

Structure of Production

In Europe, compared with North America: -

- there are in total more people employed;

- there are in total many more establishments;

- the size of establishment, in terms of average number of persons employed, is lower,

- size of establishment, in terms of average sales turnover is much lower (average USA establishment about four times average European establishment)

In Europe, therefore, "... relatively too many firms must invest the same amount of money to modernize their capital stock and to adapt it to market developments. This is doubtless a partial explanation of the fact that in absolute terms the sector invests as much, if not more (1958-1965 inc.) in Europe as in America." Europe suffers from less specialisation, less recourse to sub-contracting and shorter production runs than America;

"178. To sum up, the structure of the sector in Europe entails in all countries a waste of capital invested in most branches; this wastage appears to be greatly reduced in certain cases by the creation of new industries, not only putting to immediate use modern equipment, but also adapting their organisation to benefit from scale economies. There is no doubt that the success in Europe of certain durable consumer goods (refrigerators, cars, etc. in one European country) and also that of some Japanese capital goods (particularly ships) can be largely attributed to far more efficient production methods than those presently prevailing in the European sector."

BOCRX60-R

Fuller utilisation of capital, as in America, means faster real depreciation so that "... technical developments can be promptly incorporated ... security against economic obsolescence".

Structure of the Market

European population 50% higher than USA but global purchasing power in USA higher than Europe; "... results not only from greater natural resources, but also and above all from a much more productive economy"

American advantage partly due to uniformity of the market served. European engineering industries export about 35% of their output; compare USA only 7%. And :-

> " The heterogeneous export demand which Member countries have to meet, and the technical and administrative obstacles which still hinder trade in Europe, mean that the greater output necessary to meet export demand does not in general make for greater efficiency..."

though it is recognised that these difficulties are less "... for countries which have always had to export to numerous diversified markets abroad."

More on this theme :-

> "184. ... in 1961-1963, the European engineering industries spent considerable sums of money in order to instal larger capacity to meet the still high demand and in anticipation of a huge market in the future, and also in order to rationalise their production in face of an increasing labour shortage. But these investments were made in production structures unadapted to a large market - which, moreover, does not exist yet. The slowing down of demand which has occured since has left the European sector with a large surplus production capacity .... Pressure on prices and rising labour costs enhance the effects of insufficient capital returns: it therefore follows that the firms in the sector are short of funds for investment in the installation of more productive equipment".

And "187. ... compared with Europe the Japanese sector has invested in a production structure (with a corresponding market) much better equipped to bring in satisfactory returns on capital. The Japanese engineering industries, sustained by a domestic market that has been expanding strongly for several years, have concentrated their efforts successively on a limited range of products (optical instruments, radios, photographic apparatus, ships, ferries, motorcycles, cars and electrical equipment) and on selected export markets. Their investments, together with efforts to improve firms' organisation, have borne fruit in plenty and have enabled the Japanese sector to outstrip the production (at constant 1958 prices) of Germany in 1964 and of the United Kingdom in 1965 (see Graph 12) with a relatively low rate of new labour recruitment, and without raising prices, achieving an average yearly increase of deliveries per employee of 10 per cent since 1954."

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The UK

There are paragraphs dealing in detail with each member-country; those (paras. 219 - 222) on the UK point out that :-

- output (deliveries) per employee, although rising over past years, was in 1966 one of the lowest figures for any OECD country;

- with new investments, likewise, the history is of increase which still leaves it (in relation to number of employees) behind most of the OECD; moreover the new investments themselves seem to have led to no great increase in productivity. "Various factors, such as market and particularly production structure, including trade union structure, hampered a more economic use of the capital invested in the United Kingdom sector."

==========

Scope

There are 21 member countries of the OECD :-

Austria,	Japan,
Belgium,	Luxembourg,
Canada,	The Netherlands,
Denmark,	Norway,
France,	Portugal,
Germany (Federal Republic),	Spain,
Greece,	Sweden,
Iceland,	Switzerland,
Ireland,	Turkey,
Italy,	UK,
	USA.

The report gives some figures for the non-OECD world as well as country-by-country data within OECD.

It is explained that

" Due to the limited availability of comparable statistics, however, only the following products listed according to the Standard International Trade Classification could be covered in the basic Statistics used for this report".

ie (summary) :-

Machinery and electric machinery
Transport equipment (vehicles of all types, ships, aircraft)
Instruments, watches & clocks (but some exceptions)
Hand tools
Metal household goods (including refrigerators)

Four tables that follow represent a small selection from the great quantity of statistics in the report; they do not incorporate any of the detailed material on individual product groups. The tables are :-

BOC RX60-1

SOME OBSERVATIONS

Table 1
Relative Position of the Engineering Industries, 1965

37% of all UK industrial production is in engineering (only Switzerland and Japan show a higher figure.

UK has 9% of OECD total engineering production (compare USA 55%, Germany 10%, Japan 9%)

Table 2
Output (Deliveries) per Employee in the Engineering Industries in Major OECD Countries, 1954 and 1964

Ideally, a "league table" would be in terms of value added ("net output"), but adequate statistics do not exist. Net output is doubtless correlated in some measure with these figures of gross output (= turnover), but the correlation may not be very high.

USA nearly 2½ times its nearest rival (Japan), 3½ times UK; despite low USA rate of improvement in past years.

If (an extreme, unlikely, assumption; illustration only) rates of increase as shown were to be maintained into the future, then Japan would "overtake" USA in 1980 (in these terms ie output per employee)

The German record and achievement appears in this table (though Table 4 contrasts) no better than the British; scope for rationalisation in Germany?

Table 3
Relative Importance of Imports and Exports in the Engineering Industries (Certain countries only)

UK import ratio not unduly high or rising unduly fast; suggests that UK emphasis needs to be on export promotion rather than import substitution.

Table 4
Salient Statistics of World Trade in Engineering Products

UK still a much bigger engineering exporter than Japan, but soon to be overtaken if recent trends continue.

EEC countries' imports from outside EEC, especially from USA, large and rising, despite the tariff barrier.

(19.2.68)

BOCRX 60-U

ANNEX D

RELATIVE POSITION OF THE ENGINEERING INDUSTRIES, 1966

	Contribution of engineering industries to the total-		Each country's contribution to OECD total of engineering production
	National income (GDP)	Industrial production	
	% of GDP	% of all industrial production	%
Germany	16	32	10
France	13	32	6
Italy	7	19	2
Benelux	10	25	2
sub-total EEC	13	31	20
UK	16	37	9
Sweden	13	34	1.5
Switzerland	17	44	1.3
6 smaller European countries*	3 to 10	12 to 15	2
Sub-total Europe OECD (including EEC)	13	31	34
Canada	7	18	2
USA	13	36	55
Japan	14	38	9
OECD	13	33	100

* Austria, Norway, Portugal, Greece, Ireland, Spain

Source: Table 2 of OECD Report

(19.2.68)

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[illegible] (DELIVERIES) AND INVESTMENT IN THE
[illegible]
1954 AND 1966[1]

	$ US&OECD, 1963 price level		Average rate of increase % pa, over 12 years
	1954	1966	
USA	20.3	24.9	1¼%
Japan	3.1	10.5	10%
Sweden	6.8	9.6	3%
EEC	5.3	8.0	3½%
UK	5.0	6.9	2¼%
In the EEC			
Germany	5.1	6.9	2¼%
Italy	4.7	7.3	4¼%

[illegible] moving-averages. 1966 estimated

[1] Source see Graphs 10 and 11 of OECD Report

BUC RX 66-W

ANNEX II

RELATIVE IMPORTANCE OF IMPORTS AND EXPORTS IN THE ENGINEERING INDUSTRIES
(Certain countries only)

	Share of imports in total domestic demand for engineering products		Share of exports in total production	
	1962 %	1966 %	1962 %	1966 %
UK	10.5	13.1	31.7	31.3
Germany	14.0	18.4	40.0	45.0
France	16.4	20.5	21.2	23.5
Italy	28.9	33.9	31.7	49.7

Source: Tables 11.3 and 11.4 of OECD Report

(19.2.68)

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SALIENT STATISTICS OF WORLD TRADE IN ENGINEERING PRODUCTS

$ US million

		Exports	Imports -	- including imports from -			
				USA	Germany	Japan	UK
USA	1965	11,100	4,000	-	920	790	510
	1966	12,350	5,800	-	1,170	1,030	740
Germany	1965	9,400	2,980	520	-	80	260
	1966	10,600	3,040	530	-	80	280
France	1965	3,000	2,400	450	880	10	250
	1966	3,400	2,850	480	1,080	25	290
Italy	1965	2,500	1,300	200	490	10	130
	1966	2,900	1,510	230	600	10	150
Japan	1965	3,200	750	490	100	-	60
	1966	4,000	810	490	100	-	70
UK	1965	6,200	1,800	550	370	50	-
	1966	6,800	2,020	590	420	85	-
WORLD	1965	52,000					
	1966	59,000					

Source: Tables III.17 and III.18 of the OECD Report

19.8.68.

BOC RX 60-Y

APPENDIX 7

A NOTE ON STATHAM

(STATHAM INSTRUMENTS INC.)

Introduction

The company is engaged in the design, development, manufacture and sale of instruments for use in making precise measurements, most of which employ the use of a transducer which is the subject of many of the company's patents.

The company has 950 employees and premises in Los Angeles, Oxnard, California and Puerto Rico. It also owns a 2½ acre site in Malibu, California.

Sales and Profits

Sales (US $ millions)

Year to 31 May	1964	1965	1966	1967	1968	9 months to 28.2.1969
Aerospace	8.0	8.8	10.2	10.0	5.9	(not
Medical & Indus:	1.4	2.4	4.5	5.7	6.1	available)
Total Sales	9.4	11.2	14.7	15.7	12.0	10.4

The above figures show the declining importance of Aerospace sales in the company's product mix and the substantial sales growth achieved in medical and industrial products. However, growth in the latter field appears to have largely been achieved by the following cash acquisitions.

1964 - acquired Medicon Division of Quality Precision Products Inc., Los Angeles and Mediquipment Co., Santa Fe Spring, California.

1965 - April. Acquired Electro-Medical Engineering Co. (now Statham Medical Instruments Division).

1968 - January. Acquired Exactel Instrument Co., Mountain View, California.

- May. Acquired assets of National Electric Instruments Co., Elmshurst, New York.

Details of the purchase price or sales of the above acquisitions are not available at this time.

Pre-tax, Pre-interest Profits

Year to 31 May	1964	1965	1966	1967	1968
Profits (US $ million)	1.1	1.4	1.8	2.2	/.2/
" % of sales	11.6	12.9	12.1	14.1	/1.9/

BOC RX 60-2

The following table compares costs and profits for 1967 and 1968.

(US $ Millions)	1967	% Sales	1968	% Sales
Sales	15.7	100.0	12.0	100.0
Cost of Sales	10.5	67.1	9.2	76.4
Selling Expense etc.	3.0	18.8	3.0	25.3
Pre-tax & interest profit	2.2	14.1	/.2/	/1.7/

The 1968 annual report gives no reasons for the profit decline, which has continued in the 9 months to 28 February 1969 (pre-tax figures are not available but net income after tax credits was $340,000 against $424,000 for the same period of 1967/8.) As the company does not provide a breakdown of profits between its aerospace and medical/industrial businesses, it is not possible to deduce whether the profit decline is due to losses on aerospace or whether aerospace has been the only profit contributor in the past so that the sharp decline in this activity has revealed losses experienced on the medical/industrial side. The acquisition of Exactel Instrument Co. is unlikely to have had much effect as it was only acquired in January 1968.

Capital Employed

From 1964 to 1968 the company's Working Capital increased from $3.2 million to $6.7 million while borrowings of $650,000 have been repaid. Stocks increased by $1.1 million or 30% during the year ended 31st May 1968 although sales during the same period declined by 23%. This increase in stocks may have been partly due to the acquisition of National Electric Instrument Company at the end of May. Current liabilities at that date included $300,000 representing the balance of the purchase price for the assets of that company.

Earnings & Share Price

	1964	1965	1966	1967	1968
Earnings (US $ million)	0.9	1.1	1.3	1.6	/.2/
Earnings per share*	$.69	$.84	$1.04	$1.24	/$.15/
Average share price*	$10.5	$15.5	$14.2	$22.3	-
P/E Ratio	15.3	18.4	13.7	18.0	-

* adjusted for 50% Stock dividend on 14th October 1966.

The company's shares are held by L.D. Scanlon (President) and his family. The shares are quoted on the American and Pacific Coast Stock Exchanges. No cash dividends have been paid by the Company.

Currently the share price is trading at a 1969 'low' of $25, down from a 'high' for the year of $39½. At $25 per share the company's market capitalisation is $22 million against stockholders equity (book value) of $10 million.

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Observations

There have been some discussions on the possibility of BOC distributing Statham's products outside the US and Statham distributing BOC's medical equipment within the US. The continued independence of Statham will depend on its ability to make profits on medical and industrial sales. The continuation of losses for the nine months to February 28th 1969 raises considerable doubt over the future of the company which may be somewhat clarified when the 1969 annual report is available.

BOC Rx 61

October 14, 1969

Mr. S. M. Loveman
President
Burdett Oxygen Co.
3300 Lakeside Avenue
Cleveland, Ohio 44114

Dear Mickey:

Thank you for your letter of September 30 and the catalogues enclosed which, as you suspected, were on my desk when I returned from the UK.

I have now had an opportunity to give serious consideration to the American Industrial Safety Equipment Company and have come to the conclusion that this is not an investment for Canox in the USA. I also discussed this possibility with BOC while in the UK and they are of a similar opinion. We have come to the conclusion that we will make a fairly comprehensive study of the industrial gas market in the USA before committing ourselves to any investment opportunities.

In your letter of September 4 you said that you would like to sell this company on a selective basis and that you did not want it circulated that the company is being offered for sale. You are, however, aware of my connection with Harris Calorific and I know they had some discussions with you in the not too distant past, so I took the liberty of casually mentioning, to Steve Taylor that American Industrial Safety Equipment might still be available if they were interested. I am afraid here too I received a negative reply as they do not feel the production techniques fit in with their present experience. I do not believe I betrayed your confidence since we are a substantial shareholder in Harris and naturally I speculated whether this might be a "fit" for them.

In the next couple of months I may ask you to let me visit with you and bring with me Mr. Dore Greenfield who is in charge of market research for BOC.

Yours sincerely,

JAP/P

J. A. Perham
President

A 5145 Box Rx 72-A

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1967
V.1

1967 CENSUS OF MANUFACTURES

Vol. I

SUMMARY AND SUBJECT STATISTICS

Issued January 1971

U.S. DEPARTMENT OF COMMERCE
Maurice H. Stans, Secretary
Rocco C. Siciliano, Under Secretary
Harold C. Passer, Assistant Secretary for Economic Affairs

BUREAU OF THE CENSUS George Hay Brown, Director

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Chapter 9
Concentration Ratios

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CONCENTRATION RATIOS

GENERAL

This special report provides concentration ratios and other information on the share of industrial activity accounted for by the largest companies, both for the United States as a whole and for each of approximately 422 manufacturing industries. It brings forward the information published in the 1966 Annual Survey of Manufactures reports, *Value of Shipment Concentration Ratios by Industry*, M66(AS)-8 and M66(AS)-8 Supplement. The latter report was also published as chapter 9 of the 1966 Annual Survey of Manufactures volume.

CONCENTRATION RATIOS AND THE ESTABLISHMENT BASIS OF REPORTING

The concentration ratios based on census of manufactures data have consistently been prepared from establishment reports. Virtually all other studies have been prepared on a consolidated company basis; that is, the entire sales or assets of a given company are tabulated under one industry heading. Under the establishment system, on the other hand, the shipments of a given company are distributed among all of the industries in which it has establishments. In tables 1 through 4 in this report, which reflect the activity of the largest companies in the industrial sector as a whole, the establishment approach means that only the manufacturing establishments of these companies are taken into account in determining their size. In table 5, a "company" is defined as the total of the individual establishments under one ownership within an industry. Consequently, the same company may appear in several industries, if it has diversified activities.

CONCENTRATION RATIOS AND THE SIC SYSTEM

In essence, the SIC system seeks to establish spheres of economic activity which are unique and distinguishable from other spheres because of a composite of similar characteristics which they have in common. These characteristics include similarity of products in terms of their uses and the bringing together of plants which specialize in making these products and account for a significant proportion of their total shipments. They also include similarity of processes, similarity of materials used, and the bringing together of a group of plants which are economically significant in terms of their number, value added by manufacture, value of shipments, and number of employees. These standards flow very largely from the actual structure into which American businesses have grouped themselves and it is these characteristics that make it the best single system for the largest number of uses. In the great majority of instances, an industry is comprised of producers of similar goods or services. Usually, but not always, the products are made of similar materials and by similar processes and the producers usually compete with one another.

For the purpose of measuring concentration, the fact that the classification system is not based exclusively on the usage of the product is somewhat of a limitation, since in the economic concept of the market it is immaterial whether products which are substitutable for each other are produced by the same processes or made from the same materials. In some cases, the industry and product definitions are too broad; that is, there are included in the same category products which do not serve the same function and are thus not substitutable for each other: in other cases they are too narrow; that is, a single category fails to include products which are substitutable, for example, metal and glass containers.

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Another limitation is the fact that the classification's industries and products are regularly being redefined. The need for redefinition arises particularly from the introduction of new products, the declining importance of older products, the introduction of new technologies, the growth of small fields into important industries, and similar dynamic developments. While necessary to keep the classification abreast of the changing nature of the economy, an inevitable cost of redefinition is the loss of comparability for many categories over time. Among other limitations of concentration ratios, may be mentioned the problems associated with industries which have local or regional rather than national markets, and the necessity for using domestic production (or its approximate equivalent in shipments), rather than domestic consumption, as a measure of the size of the market. These and other qualifications are discussed at greater length in the introduction to the 1963 Census report, *Concentration Ratios in Manufacturing Industry, Part 1.*

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TABLE 5. Percent of Value of Shipments Accounted for by the Largest Companies in Each Manufacturing Industry: 1967 and Earlier Years—Continued

Code	Industry and year[1]	Companies[2] (number)	Value of shipments[3] Total (million dollars)	Percent accounted for by—[4] 4 largest companies	8 largest companies	20 largest companies	50 largest companies	Primary product specialization ratio[5] (percent)	Coverage ratio[6] (percent)
	MAJOR GROUP 27. PRINTING AND PUBLISHING—Continued								
2753	Engraving and plate printing....1967....	569	137.9	21	28	38	52	91	81
	1966....	(NA)	175.9	(8)	(8)	(NA)	(NA	(NA)	(NA)
	1963....	574	111.1	26	34	47	62	89	79
	1958....	530	88.2	26	35	46	59	92	82
	1954....	545	80.1	24	30	41	(NA	93	79
	1947....	413	45.2	28	44	58	(NA	92	80
	1939....	(NA)	(NA)	33	40	(NA)	(NA	(NA)	(NA)
2761	Manifold business forms....1967....	454	932.3	47	57	69	81	91	89
	1966....	(NA)	833.9	47	57	(NA)	(NA	(NA)	(NA)
	1963....	439	637.7	46	55	68	80	90	91
2771	Greeting card publishing....1967....	200	517.9	67	79	88	95	97	93
	1966....	(NA)	460.1	64	76	(NA)	(NA	(NA)	NA
	1963....	230	346.0	57	71	88	92	92	96
	1958....	265	276.0	45	62	78	89	94	93
	1954....	290	206.9	42	57	73	(NA	93	89
	1947....	161	123.8	39	56	74	(NA	92	97
2782	Blankbooks and looseleaf binders....1967....	408	381.3	35	45	60	77	96	88
	1966....	(NA)	344.2	(8)	(8)	NA)	(NA	(NA)	NA
	1963....	380	288.2	33	44	57	74	88	88
2789	Bookbinding and related work....1967....	1,000	340.6	11	18	30	47	94	89
	1966....	(NA)	349.1	(8)	(8)	NA)	(NA	(NA)	NA
	1963....	1,038	228.5	12	17	28	44	95	83
	1958[10]..	966	162.0	10	16	NA)	(NA	94	88
2791	Typesetting....1967....	1,518	356.7	7	11	19	32	95	92
	1966....	(NA)	309.6	5	(8)	NA)	(NA	(NA)	NA
	1963....	1,271	241.0	6	10	18	31	95	90
	1958....	1,181	175.1	6	10	19	33	93	92
	1954....	1,078	121.4	5	9	18	(NA	94	87
	1947....	793	79.7	8	13	24	(NA	94	87
2793	Photoengraving....1967....	732	234.3	10	16	27	44	94	91
	1966....	(NA)	225.0	(8	(8)	NA)	(NA	(NA)	NA
	1963....	872	213.4	8	13	24	36	95	91
	1958....	807	206.0	8	13	24	37	95	93
	1954....	884	173.0	6	11	21	(NA	95	83
	1947....	754	133.8	8	12	22	(NA	96	96
2794	Electrotyping and stereotyping....1967....	134	62.1	34	45	63	87	89	85
	1966....	(NA)	61.2	(8	(8)	NA)	(NA	(NA)	NA
	1963....	170	76.1	31	39	57	81	87	86
	1958....	206	77.7	29	38	49	73	92	87
	1954....	219	66.9	23	34	51	(NA	89	89
	1947....	205	59.0	24	34	49	(NA	92	87
	1939....	(NA)	(NA)	36	46	NA)	(NA	NA)	NA
	MAJOR GROUP 28. CHEMICALS AND ALLIED PRODUCTS								
2812	Alkalies and chlorine....1967....	19	719.8	63	86	100	1	97	75
	1966....	(NA)	782.7	63	86	NA)	(NA	(NA)	NA
	1963....	19	652.1	62	88	100	1	96	79
	1958....	18	486.1	64	89	100	1	73	84
	1954....	17	399.0	69	90	100	1	76	84
	1947....	18	268.6	70	93	100	1	81	89
2813	Industrial gases....1967....	113	888.7	67	84	95	99	96	89
	1966....	(NA)	849.7	72	90	NA)	NA	(NA)	NA)
	1963....	104	628.4	72	86	98	99	98	97
	1958....	111	332.0	79	88	96	98	97	84
	1954....	102	167.7	64	88	98	(NA	99	84
	1947....	80	98.5	83	96	94	(NA	100	84
	1939....	(NA)	(NA)	79	87	NA)	(NA	(NA)	(NA)
2814	Cyclic intermediates and crudes[11]....1967....	115	1,966.8	45	64	83	97	73	86
2815	1963....	130	1,313.8	33	71	88	99+	NA)	NA)
2816	Inorganic pigments....1967....	65	549.3	39	78	95	99+	99	84
	1966....	(NA)	561.8	64	83	NA)	(NA	(NA)	(NA)
	1963....	89	484.8	68	84	96	99+	91	87
	1958....	87	402.6	69	83	96	99+	98	89
	1954....	73	371.4	67	83	96	(NA	88	88
	1947....	(11)	287.0	(11)	(11)	(11)	(11	(11)	(11)

See footnotes at end of table.

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TABLE 5. Percent of Value of Shipments Accounted for by the Largest Companies in Each Manufacturing Industry: 1967 and Earlier Years—Continued

Code	Industry and year[1]	Companies[2] (number)	Value of shipments[3] Total (million dollars)	Percent accounted for by—[4] 4 largest companies	8 largest companies	20 largest companies	50 largest companies	Primary product specialization ratio[5] (percent)	Coverage ratio[6] (percent)
	MAJOR GROUP 39. MISCELLANEOUS MANUFACTURING INDUSTRIES—Continued								
3991	Brooms and brushes.....1967....	816	371.8	33	44	58	75	90	92
	1966....	(NA)	374.4	32	42	(NA)	NA)	(NA)	NA)
	1963....	838	321.1	31	41	57	73	89	NA)
	1958....	713	252.2	23	33	49	65	87	90
	1954....	688	185.4	21	32	47	NA)	91	89
	1947....	698	178.8	22	36	54	NA)	94	87
3993	Signs and advertising displays.....1967....	3,189	875.1	6	10	17	28	97	98
	1966....	(NA)	818.8	6	10	(NA)	NA)	(NA)	NA)
	1963....	3,165	646.8	5	8	15	26	96	95
	1958....	3,689	446.9	5	8	14	26	96	97
	1954....	3,600	333.3	6	11	18	(NA)	93	92
	1947....	1,833	304.7	5	9	18	NA)	95	88
	1939....	(NA)	(NA)	9	14	(NA)	(NA)	(NA)	NA)
3995	Burial caskets (previously identified as SIC 3995).....1967....	537	308.1	22	38	62	88	95	96
	1966....	(NA)	319.1	22	38	(NA)	(NA)	NA)	NA)
	1963....	581	290.0	20	37	61	87	95	96
	1958....	563	226.6	21	38	62	86	95	99
	1954....	541	166.1	20	36	58	(NA	97	97
	1947....	528	166.8	26	34	45	(NA	90	97
	1939....	(NA)	(NA)	17	23	NA)	(NA	NA)	NA)
3996	Hard surface floor coverings (previously identified as SIC 2863).....1967....	18	221.7	89	99	100	I	98	97
	1966....	(NA)	230.3	89	98	(NA)	(NA	NA)	NA
	1963....	15	204.1	87	96	100	I	82	96
	1958....	11	178.8	83	(D)	100	I	NA)	NA
	1954....	10	181.6	87	(D)	100	I	88	97
	1947....	14	173.3	80	96	100	I	91	100
3999	Manufactures, n.e.c.[7][8].....1967....	2,165	943.3	10	17	28	42	94	90

Note: The figures shown in parentheses either have associated standard errors exceeding 15 percent or are not consistent with other Census series and related data. Thus, these estimates may be of limited reliability.

Standard Notes: - Represents zero. (D) Withheld to avoid disclosing figures for individual companies. NA) Not available. 1 Not applicable. (S) Data suppressed because some of the largest companies were approximately the same size as others not included in the sample, and therefore a reliable numerator could not be computed. Revised.

n.e.c. Not elsewhere classified. n.s.k. Not specified by kind.

[1] Industry codes and descriptions are based on the 1957 Standard Industrial Classification Manual (SIC) as modified through 1967. This classification system represented a substantial revision from the previous 1945 edition and was put into effect with the final reports in the 1958 cens.s. However, the concentration ratios in 1958 were tabulated on the 1945 edition to preserve comparability to prior years. Also in 1958, establishments in Alaska and Hawaii were not included as part of U.S. industry totals since these States did not attain Statehood until 1959. Data and ratios for 1958 and prior years are shown in this report only if the industry definitions are so closely comparable that the concentration ratios could not be affected by the shifting of plants due to industry classification changes or by the change in treatment of Alaska and Hawaii. See "Concentration Ratios in Manufacturing Industry: 1958," Part I, table 7, for comparability of old-new industry definitions.

[2] The determination of company affiliation of establishments is based on census reports and publicly available records. Value of shipment totals for establishments have been summarized into company totals in each manufacturing industry. "Largest" companies are determined by each company's value of shipments in the specified industry.

[3] Value of shipments figures are not completely comparable between the years 1963-67 and prior years. They include for all establishments classified in the industry (a) value of products primary to the industry, (b) value of all secondary products which are primary to other industries, (c) value of miscellaneous receipts—such as receipts for contract and commission work on materials owned by others, scrap, salable refuse, repairs, etc., and (d) value of resales—i.e., products resold in same condition as bought. In 1958 and prior years value of resales was excluded from value of shipments.

[4] The percentages consist of the sum of the value of shipments of the largest 4 companies (or 8, 20, or 50 companies), divided by the total value of shipments of the industry.

[5] The "primary product specialization ratio" measures the extent to which plants classified in the industry specialize in making products regarded as primary to the industry, that is, value of shipments of primary products of plants in the industry is expressed as a ratio of the total shipments of all products made by these establishments (excluding miscellaneous receipts, such as receipts for contract and commission work on materials owned by others, scrap and salable refuse, repair, etc.).

[6] The "coverage ratio" measures the extent to which all shipments of primary products of an industry are made by plants classified in the industry, as distinguished from secondary producers elsewhere; that is, value of shipments of the primary products made by plants classified in the industry is expressed as a ratio of the total shipments of primary products made by all producers, both in and out of the specified industry.

[7] Value added by manufacture is shown for this industry rather than value of shipments because the latter contains a substantial and unmeasurable amount of duplication. The calculations for the 4, 8, 20, and 50 largest companies also are based on value added. The value added figure for 1963 and later years is adjusted value added; for 1958 and prior years it is unadjusted value added. Adjusted value added is calculated by subtracting the cost of materials including cost of resales from the value of shipments including resales and adjusting for the change in finished products and work-in-process inventories during the year. Unadjusted value added includes value added by resales and any inventory change.

[8] Not completely comparable to 1958 and later years because of a change in industry classification. For discussion of 1947 to 1954 comparability, see 1954 Census of Manufactures, Volume II, Industry Statistics, "Dairy Products."

[9] In 1954, industry 2027, Fluid Milk, was composed of two industries, 2026, Fluid Milk only), and 2027, Fluid Milk and Other Products. In 1954 figures on value of shipments and share of value of shipments accounted for by the 4 and 8 largest companies have been recalculated on a basis comparable to 1958. In 1947 and earlier years, establishments primarily distributing fluid milk were classified as nonmanufacturing.

[10] Establishments in Alaska and Hawaii are important producers in this industry. Recomputed figures cannot be shown for the 4, 8, 20, and 50 companies prior to 1963 without disclosing the operation of individual companies in Alaska and Hawaii.

A 5151

BOC RX 72-G

TABLE 5. Percent of Value of Shipments Accounted for by the Largest Companies in Each Manufacturing Industry: 1967 and Earlier Years—Continued

FOOTNOTES—Continued

[64] Value of production shown for this industry rather than value of shipments. For 1963 and subsequent years the figure includes value of primary and secondary products made, miscellaneous receipts such as receipts for contract and commission work on materials owned by others, scrap and other salable refuse, and the value of products bought and resold in the same condition. For 1958 and prior years resales are excluded.

[65] The 1963 data for industry 2036 are not completely comparable to 1958 and subsequent years; 1947 data are not available. In 1967 industry 2036, Packaged Seafood, was in part (frozen packaged seafood) included in industry 2037, Frozen Fruits, Vegetables, and Fish, and in part (fresh packaged seafood) included in nonmanufacturing industries (principally industry 5046, Fish and Seafoods). A significant but undetermined number of establishments classified in industry 2036 in 1958 and 1963 were probably classified in industry 5046 in 1954.

[66] Includes data for 21 wholesale distributors of malt liquors. Each had less than 10 employees and had no significant effect on any of the statistics for the industry except the establishment and company counts.

[67] Bonded store rooms which were engaged in blending wines were included in 1966, 1963, 1958, and 1954, but excluded in 1947.

[68] The discrepancy between these figures and those appearing in table 1 of the 1958 Census of Manufactures, Volume II, Chapter 20M, Fats and Oils (68 companies and 1934,865 thousand value of shipments) is due to a misclassification of 16 small companies into industry 2092. These companies should have been classified into industry 2096, Shortening and Cooking Oils.

[69] The 1967 SIC combined into this industry two industries which were separate in the 1963 SIC: industry 2882, Linseed Oil Mills, and industry 2884, Vegetable Oil Mills, N.E.C. The 1958 value of shipments figures for these two industries have been combined and the ratios for the 4 and 8 largest companies have been recomputed on a basis comparable to 1963 and 1966.

[70] The SIC, as revised in 1963, combined into this industry two industries which were separate in the 1963 SIC: industry 2886, Grease and Tallow, and industry 2889, Animal Oils, N.E.C. The 1958 value of shipments figures for these two industries have been combined and the ratios for the 4 and 8 largest companies have been recomputed on a basis comparable to 1963 and 1966.

[71] The 1967 SIC combined into this industry two industries which were separate in the 1963 SIC: industry 2092, Shortening and Cooking Oils, and industry 2093, Margarine. The 1958 value of shipments figures for these two industries have been combined and the ratios for the 4 and 8 largest companies have been recomputed on a basis comparable to 1963 and 1966.

[72] Comparable data are not available because of significant changes in the 1967 classification of plants or products in this industry.

[73] Jobbers were included in 1967 but excluded in 1954 and later years.

[74] Value of production shown for this industry in 1958 and prior years whereas value of shipments is shown for 1963 and later years. This change does not affect the comparability significantly. For industries 2253, 2254, 2256 and 2259, the method of computing coverage and specialization ratios was changed in 1967, causing a significant decrease in some ratios. See the separate report in the Industry Series for a more detailed discussion of this subject.

[75] The SIC combined in this industry two industries which were separate in the 1967 SIC: industry 2255, Knit Glove Mills, and industry 2259, Knitting Mills, N.E.C. The 1958 value of production figures for these two industries have been combined and the ratios for the 4 and 8 largest companies have been recomputed on a basis comparable to 1963 and later years.

[76] Includes finished cotton broadwoven fabrics (except commission finishing) which are also primary to industry 2211, Weaving Mills, Cotton. See the separate report for this industry in the Industry Series for a more detailed discussion of this subject.

[77] Includes finished synthetic fabrics (except commission finishing) which are also primary to industry 2221, Weaving Mills, Synthetics. See the separate report for this industry in the Industry Series for a more detailed discussion of this subject.

[78] Includes finished yarns (except wool which are also primary to industry 2281, Yarn Mills, Except Wool. See the separate report for this industry in the Industry Series for a more detailed discussion of this subject.

[79] Excludes shipments of finished purchased yarns from establishments classified in industry 2269, Finishing Plants, N.E.C. See the separate report for this industry in the Industry Series for a more detailed discussion of this subject.

[80] This industry included a large number of very small establishments in 1958, and there is a possibility that some were misclassified as to industry. Industry misclassification of these small establishments does not affect significantly any statistics other than the number of establishments and companies.

[81] This industry included a large number of very small establishments in 1963 and some of these small establishments may have been misclassified as to industry. Industry misclassification of these sm establishments does not affect significantly any statistics other than the number of establishments and companies.

[82] Includes products of Knitting Mills (SIC Group 225) which are primary to industries 2253 and 2254. See the separate report for this industry in the Industry Series for a more detailed discussion of this subject.

[83] Includes the shipments of women's and children's knit underwear and nightwear made in knitting mills (primary products of industry 2254) as well as the shipments of these products cut and sewed from purchased knit cloth. See the separate report for this industry in the Industry Series for a more detailed discussion of this subject.

[84] The 1967 SIC combined into this industry four industries which were separate in the 1963 SIC: industry 2281, Fur-Felt Hats and Hat Bodies; industry 2282, Wool-Felt Hats and Hat Bodies; industry 2283, Straw Hats; and industry 2285, Men's and Boys' Cloth Hats. The 1958 value of production figures for these four industries have been combined and the ratios for the largest 4 and 8 companies have been recomputed on a basis comparable to 1963 and 1966.

[85] Includes the shipments of children's knit outerwear made in Knitting Mills (primary products of industry 2253) as well as the shipments of these products cut and sewed from purchased knit cloth. See the separate report for this industry in the Industry Series for a more detailed discussion of this subject.

[86] Includes the shipments of fabric gloves made in Knitting Mills (primary products of industry 2259) as well as the shipments of fabric gloves cut and sewed from purchased fabrics.

[87] The 1967 SIC combined in this industry two industries which were separate in the 1963 SIC: industry 2381, Fabric Dress Gloves, and industry 2383, Fabric Work Gloves. The 1958 value of shipments figures for these two industries have been combined and the ratios for the 4 and 8 largest companies have been recomputed on a basis comparable to 1963 and 1966.

[88] A review of the reports for 1963 indicated that there were approximately 300 very small companies included in this industry which described their activities as custom drapery producers, interior decorators workrooms, etc. Approximately half of these companies were classified as nonmanufacturing in the 1958 Census.

[89] For 1963 the value of shipments total includes shipments of logs for establishments that own and maintain timberlands but contract the cutting of logs to others. The establishments that actually performed the logging on a contract basis also reported their receipts for contract logging under the heading total value of shipments. Thus, an undetermined amount of duplication exists in the shipments total. The figures previously reported for 1958 and prior years do not include shipments for timberland owners that do not perform their own logging.

[90] The coverage ratio for this industry is unusually low because of the large amount of wood chips manufactured by establishments classified in industry 2421, Sawmills and Planing Mills, general.

[91] The 1967 SIC combined in this industry two industries which were separate in the 1963 SIC: industry 2562, Window Shades, and industry 2563, Venetian Blinds. The 1958 value of shipments figures for these two industries have been combined and the ratios for the 4 and 8 largest companies have been recomputed on a basis comparable to 1963 and 1966.

[92] Beginning with 1958, the concentration ratios for this industry are not comparable to those published for earlier years. In the 1958 Census of Manufactures integrated pulp and paper companies were given the option of reporting their pulp and paper (or board) operations on a combined basis when both were conducted at a single physical location. Most integrated companies exercised this option and filed a single report covering their pulp, paper (or board) making operations at a single physical location, but a few with departmental accounting chose to report separately for the pulp mill and paper (or board) mill, as they were required to do in 1954 and 1947. The only other pulp mills separately reported in the 1958 Census of Manufactures were (1) those exclusively selling their pulp on the market (i.e., not associated or affiliated with a paper and board mill), and (2) those pulp mills affiliated or associated with paper or board mills but operated at a different physical location from the paper or board mill(s).

[93] The 1967 SIC combined in this industry two industries which were separate in the 1963 SIC: industry 2781, Bookbinding, and industry 2789, Miscellaneous Bookbinding Work. The 1958 value of shipments figures for these two industries have been combined and the ratios for the 4 and 8 largest companies have been recomputed on a basis comparable to 1963 and 1966.

[94] Comparable data for previous years are not available. In 1967, industry 2814, Cyclic (Coal Tar) Crudes, was included in industry 2815, Intermediate coal tar products.

[95] Comparable data are not available. In 1947, industry 2818, Organic Chemicals, N.E.C., included industry 2815, Intermediates and Organic Colors.

[96] Government-owned establishments that are privately operated are included in this industry but did not enter into the calculation of the specialization and coverage ratios as all dollar receipts for these establishments were included as primary receipts.

A 5152

BOC RX 72-H

TABLE 5. Percent of Value of Shipments Accounted for by the Largest Companies in Each Manufacturing Industry: 1967 and Earlier Years—Continued

FOOTNOTES--Continued

[66] The 1967 SIC combined in this industry two industries which were separate in the 1963 SIC: industry 2819, Inorganic Chemicals, N.E.C., and industry 2811, Sulfuric Acid. The 1958 value of shipments figures for these two industries have been combined and the ratios for the 4 and 8 largest companies have been recomputed on a basis comparable to 1963 and 1966.

[67] Includes lubricating oils and greases which are also primary to industry 2992, Lubricating Oils and Greases. See the separate report for this industry in the Industry Series for a more detailed discussion of this subject.

[68] Includes lubricating oils and greases which are also primary to industry 2911, Petroleum Refining. See the separate report for this industry in the Industry Series for a more detailed discussion of this subject.

[69] Includes data for industry 2991, Fuel Briquets and Packaged Fuels, and industry 2999, Petroleum and Coal Products, N.E.C. These industries were shown separately in 1947.

[70] The 1967 SIC combined in this industry two industries which were separate in the 1963 SIC: industry 3192, Saddlery, Harness, and Whips, and industry 3199, Leather Goods, N.E.C. The 1958 value of shipments figures for these two industries have been combined and the ratios for the 4 and 8 largest companies have been recomputed on a basis comparable to 1963 and 1966.

[71] This is a minimum ratio. The exact ratio is withheld to avoid disclosing figures for individual companies.

[72] The 1966 and earlier years' shipments and associated concentration ratios are not comparable to 1963 and 1966 because of the significant amount of receipts excluded in the earlier period.

[73] Ready-mixed concrete was included in the census of manufactures for the first time in 1958. No comparable information is available for earlier years.

[74] Revised percentages not available.

[75] The value of shipments for this industry totaled $16,418 million in 1963. These values, however, include duplication in that the products of some establishments are used as materials by others. A specialization ratio computed on the basis of net value of shipments would approximate 94 percent for 1963 and 1967. Although a coverage ratio cannot be computed precisely, it would exceed 84 percent for 1967 and 86 percent for 1963. Approximate ratios for 1958 were: specialization, 94 percent; coverage, 84 percent.

[76] Industry 3312, Blast Furnaces and Steel Mills, has been redefined since 1954 to include industry 3311, Blast Furnaces; industry 3312, Steelworks and Rolling Mills; industry 2931, Beehive Coke Ovens; and industry 2932, Byproduct Coke Ovens. For 1954 and 1947, value added by manufacture and shares accounted for by the largest 4, 8, and 20 companies have been recomputed on a basis comparable to later years.

[77] This ratio is based on shipments of primary products only by this industry. However, some of these products are also primary to one or more other industries. See the separate report for this industry in the Industry Series for a more detailed discussion of this subject.

[78] Industry 3321, Gray Iron Foundries, includes, in addition to commercial (jobbing) foundries, "captive" foundries at separate locations producing gray iron castings for other plants of the same company. Accordingly, the ratios for this industry do not reflect the market shares in the commercial foundry industry as such.

[79] Ratios not meaningful because total value of primary products shipped include a significant amount of duplication.

[80] Comparable data are not available due to significant revisions in the 1954 classification of plants or products in this industry.

[81] A number of small establishments was misclassified into this industry. This affects the figure for the number of companies but has no appreciable effect on the total value of shipments or the percentage of value of shipments accounted for by the largest companies.

[82] The 1967 SIC combined in this industry three industries which were separate in the 1963 SIC: industry 3422, Edge Tools; industry 3423, Hand Tools, N.E.C.; and industry 3434, Files. The 1958 value of shipments figures for these three industries have been combined and the ratios for the 4 and 8 largest companies have been recomputed on a basis comparable to 1963 and later years.

[83] Revisions were made to this industry for prior years to include automobile stampings plants operated by automobile producing companies. Concentration ratios cannot be published for prior years on a revised basis without approximating the operations of individual companies.

[84] Indexes not meaningful because of large miscellaneous receipts, particularly receipts for contract and commission work on materials owned by others.

[85] The 1967 SIC combined in this industry three industries which were separate in the 1963 SIC: industry 3465, Enameling and Lacquering; industry 3466, Galvanizing; and industry 3467, Engraving on Metal. The 1958 value of shipments figures for these three industries have been combined and the ratios for the 4 and 8 largest companies have been recomputed on a basis comparable to 1963 and later years.

[86] Not completely comparable to 1966 and earlier years. Some companies included construction receipts, with value of shipments in 1966 and prior years. Such receipts are excluded in 1967.

[87] Comparable data are not available for 1966 and earlier years because of significant changes in the 1967 classification of plants or products of this industry.

[88] Comparable data are not available for prior years as this industry was not separately identified prior to 1967.

[89] Ratios not meaningful because total value of primary products shipped include a significant amount of duplication.

[90] Comparable data are not available due to significant revisions in the 1954 classification of plants or products in this industry.

[91] Comparable figures not available. Ratios were calculated originally on value of shipments in 1954 and 1947. 1954 ratios for the largest 4 and 8 companies have been recalculated based on value added; 1947 ratios based on value added are not available.

[92] Prior to 1967 industries 3711 and 3714 were combined and identified as industry 3717.

[93] Data for 1966 and 1963 have been revised by the exclusion of automotive stamping plants operated by automobile producing companies, as a result of this revision, these plants are now classified in the metal stampings industry (SIC 3461). Data for years prior to 1963 have not been revised.

[94] Not completely comparable to 1958, and later years because of a change in the SIC System. In 1958 and later years, an establishment manufacturing complete aircraft was classified in industry 3721, Aircraft, if its value of work done on aircraft exceeded its value of shipments of any other single industry's products. In 1954 and earlier years, any establishment manufacturing at least one complete aircraft was classified in industry 3721.

[95] Value of work done rather than value of shipments. Includes miscellaneous receipts such as receipts for contract work and commission work on materials owned by others, scrap, salable refuse, repair work, etc.

[96] Data include aircraft propellers and parts, previously identified as industry 3723.

[97] The 1967 SIC combined into this industry two industries which were separate in the 1963 SIC: industry 3952, Lead Pencils and Crayons, and industry 3954, Artists' Materials. The 1958 value of shipments figures for these two industries have been combined and the ratios for the 4 and 8 largest companies have been recomputed on a basis comparable to 1963 and later years.

[98] The 1967 SIC combined into this industry six industries which were separate in the 1957 SIC: industry 3983, Matches; 3984, Candles; 3987, Lamp Shades; 3988, Furs, Dressed and Dyed; 3988, Umbrellas, Parasols and Canes; and 3999, Miscellaneous Products, N.E.C. concentration ratio data are not available for 1966 or prior years.

DOL RX 181A 3

December 1,

President, Canox
Mr. J. A. Perham

P

Dr. Albert Muller
Still Hollow Road
R.D. 2, Lebanon, New Jersey 08333

Dear Al:

Enclosed is Leslie Smith's paper which he presented to the Chairman's Committee in Hammersmith House on November 20th. This explains our purposes and the information we will be seeking.

As you know, I propose that Dore Greenfield and I should start the field visit to the USA by spending a couple of days with you. Knowing the type of questions we will be asking, you may have some information or opinions which would be most helpful. Obviously this sort of investigation required discretion and I know you will keep this information to yourself.

JAP/P
Enc.

A 5154 BOC RX 18/B

BOC CHAIRMAN'S COMMITTEE 27 NOVEMBER 1969

Minute C1430 (v)

Study of USA Market

Information paper submitted detailing scope of study currently in hand, of American market for industrial gases and related products. Team led by President, Canox, and assisted by Central Planning, Hammersmith: completion expected early summer 1970: activity to be kept to acceptable minimum.

A 5155

BOC RX 181C

CC PAPER (for information)

STUDY OF USA MARKET

As discussed at last BOCI meeting and reported subsequently at CC, a study is being undertaken of the American market for industrial gases and related products. The major companies in this market (UCC, Airco, Air Products) have all experienced declining margins over the past several years, to the point where they are now earning little more than the cost of money. Competition remains fierce. Their reactions to this situation, particularly at the marketing and distribution end, have formed a fairly consistent pattern.

The purposes of our study are twofold:-

(i) To analyse the present and likely future situation in the American market, and to draw therefrom any lessons and experience which might have application in BOC Group.

Subsequently,

(ii) To consider whether there are any identifiable opportunities in USA which BOC might wish to exploit at some future date.

Mr J.A.Perham, President Canada, has charge of the project and is being assisted initially by Central Planning, Hammersmith House. A study, lasting perhaps three weeks, will be needed on the ground in USA and will probably be conducted early in the New Year. Only purpose (i) above will be revealed to American companies and others contacted for study purposes; it is believed that this will be a satisfying explanation in view of BOC's known international standing.

With regard to possible opportunities for BOC expansion in USA, it is recognised as essential that a realistic approach be adopted and, to this end, two yardsticks have been arbitrarily selected. The initial investment will not exceed $25 millions and must support a 15% pa return within five years.

Completion of the study, with conclusions, is not expected before early Summer 1970. An appendix to this paper sets out some of the questions to which answers will be sought.

GROUP MANAGING DIRECTOR

LES/ES
20.11.69

A 5156

Boc RX 181D

Appendix

INFORMATION REQUIRED

1 What is the basis of unprofitability of this industry over the past several years and what is the current situation ?

2 What is going to have to happen to correct this situation ?

Areas to be explored are further reductions in production costs: reduction in capital through greater distributor participation; improved plant operating efficiencies via product swapping; reduce distributor margins offset by wider product lines; verticalintegration, ie eliminating distributors; value added, ag technical services; increased gearing or other financial strategy.

3 Is a change in the structure of the industry (shake-out) predicted ?

4 Is there any foreseeable change in trading patterns, eg attitude to supply schemes, customer ownership of plant and related equipment, spot purchase by major customers ?

5 Is there any difference in trading patterns of national and regional operators ?

6 What effect does US anti-trust or fair trading laws have in the relationship of manufacturer to distributor ?

7 What is the profitability of "related products" to the manufacturer and to the distributor ?

8 Are there any detectable trends for related products and what is the product mix versus "gas" ?

9 What is the profitability of distribution ?

10 Are there any regional trends or discernable patterns in this distribution ?

11 How does the distributor see his future relationship with the manufacturer and what pressures or restrictions is he required to operate under ?

12 Are there unusual variances at the distributor level for liquid/gas product mix ?

13 What products are sold other than those related to the welding industry ?

14 Are there any potential acquisition opportunities as a by-product of this enquiry which should be recommended for further study ?

A 5157

Boc Rt 184

DEPARTMENT OF TRADE AND INDUSTRY

PRESS NOTICE

January 4 1974

CLEARANCE OF MERGER PROPOSALS UNDER THE FAIR TRADING ACT 1973

On the information at present before him, Sir Geoffrey Howe, Minister for Trade and Consumer Affairs has decided not to refer the proposed acquisition by the British Oxygen Co Ltd of a minority shareholding in Airco Inc to the Monopolies and Mergers Commission under the provisions of the Fair Trading Act 1973.

1 Victoria Street, London SW1H 0ET
01-222 7877 Ext 5031/5/6

Ref: 8

A 5158

Boc R+185

OFFICE OF FAIR TRADING
MERGERS PANEL SECRETARIAT
[redacted]
Chancery House 53 Chancery Lane London WC2A 1SP

Telephone 01-242 2858 ext 120

CAB/ 1
4 JAN 1974

C A B Leslie Esq
(Company Secretary)
The British Oxygen Co Ltd
Hammersmith House
London W 6

Your reference

Our reference MP/14/73

Date 3 January 1974

Dear Mr Leslie

I am writing with reference to our meeting on 23 November and subsequent telephone conversations when we discussed the proposed acquisition by The British Oxygen Co Ltd of a minority shareholding in Airco Inc.

I have now been asked to inform you that on the information at present before him, Sir Geoffrey Howe, the Minister for Trade and Consumer Affairs, has decided not to refer the proposed acquisition of this minority interest to the Monopolies and Mergers Commission under the Fair Trading Act 1973. You may like to know that, in accordance with normal practice, the DTI will be announcing the decision in this case by means of a press notice tomorrow morning.

If, at some future date, your company should wish to acquire a controlling interest in Airco, the situation would, of course, need to be examined again by the Mergers Panel in the light of the circumstances at that time.

Yours sincerely

J C MATHEW

A 5159

BOC Rx 187-A

for the Annual Blue 1972

A 5160

Boc Rx 187-B

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Financial Summary
(Dollars and Shares in Millions)

	1972	1971
Sales	$3,261.3	$3,037.5
Income Before Extraordinary Items	$ 207.4	$ 153.0
Per Share*	$ 3.42	$ 2.53
Net Income	$ 205.2	$ 157.8
Per Share*	$ 3.38	$ 2.61
Dividends	$ 121.3	$ 121.1
Per Share	$ 2.00	$ 2.00
% of Net Income	59.1%	76.7%
Net Income Retained	$ 83.9	$ 36.7
Total Assets	$3,718.3	$3,554.7
UCC Stockholders' Equity	$1,953.6	$1,844.3
Per Share**	$ 31.84	$ 30.45
Number of Stockholders	188,000	207,000
Shares Outstanding at Dec. 31	60.7	60.6
Construction	$ 243.9	$ 335.2
Depreciation	$ 245.2	$ 229.3
Research and Development	$ 69.6	$ 78.3

*Based on average number of shares outstanding during the year.
**Based on number of shares outstanding at Dec. 31.

ON THE COVER—Colored lights give an abstract feeling to this photograph of molecular sieves of various shapes and sizes. Because of their unique adsorbent properties, these sieves are the key to the effectiveness of several new air pollution-control processes recently introduced by Union Carbide. One of these processes—the PURASIV Hg process—is used in the installation shown below, which recovers mercury from gas streams at a 200-ton-per-day chlorine plant. Less than one part per billion of mercury is emitted.

Union Carbide Corporation Annual Report 1972

To Our Stockholders:

The year 1972 was one of much improved performance f Union Carbide. Our worldwide sales increased by 7 p cent over 1971 to a new high of $3,261 million. Earn were up 30 per cent to $3.38 per share.

Major progress was made in 1972 toward a number the goals we have set for ourselves. A particularly sign cant accomplishment was the successful start-up of c new petrochemicals complex in Puerto Rico, where ope tions have exceeded expectations from the beginning. fact, it was a year of good operating performance in near all of our plants around the world. Programs aimed at i creasing the efficiency of operations—aided by the shutt down of obsolete production units—are continuing, and w believe that our modern facilities place us in an excelle competitive position both at home and abroad in all ma product lines.

We have put much effort during recent years into reap praising our many businesses and determining those th we should support aggressively, those that we shou maintain but not necessarily expand, and those from whic we should withdraw. Further progress in this regard wa made during 1972, and we feel that the objectives an areas of interest of the entire Corporation have been sharp ened. We intend to concentrate on those businesses w know best and those we are good at, and we will contin to emphasize the pursuit of new areas of opportunity on selective basis.

Progress was made in our pollution-control efforts, an we continued in compliance with existing state and federa schedules.

A great deal of attention was given in 1972 to the organ zation of our management, our people, and the way in which we conduct our affairs. A formal management sy tem was adopted, which we believe will aid materially the establishment of objectives and of effective means t reach them, and in the measurement and control of per formance. Three new Executive Vice-Presidents were named, each with responsibility for certain domestic bu nesses as well as worldwide planning for these; in addi each has operating responsibility for one or more geo graphic areas outside of the United States.

We were pleased to welcome to the Board in Septem ber Dr. Jerome H. Holland, former United States Ambassador to Sweden. During the year, the members of the Board o

A 5161

Boc Rx 187-C

Directors devoted considerable effort to reviewing some of the problems faced by our management, particularly in areas relating to the public interest and to the interests of stockholders. Three committees of the Board were formed: an Audit Committee, a Public Policy Committee, and a Compensation Committee. Each has already demonstrated its effectiveness and worth.

Among problems we faced in 1972 was increased competition in some segments of our metals and carbons business in the United States, with resultant price weakness due in part to a record level of imported ferroalloys. However, our worldwide position in these products is exceptionally strong. The energy problem in the United States is of particular concern to Union Carbide, as our chemicals and plastics business is dependent upon hydrocarbons as a major raw material, and we are also very large users of fuel and electric power. Costs of labor and materials continued to rise but our selling prices, on average, declined slightly. Nevertheless, our earnings improved. Although we were not seriously handicapped by Phase 2 of the wage and price control program, we consider the announcement of Phase 3 a constructive step and believe the impact of the changes will prove to be beneficial to Union Carbide.

We look forward to another year of good progress in 1973. We believe we are purposefully set on the course we intend to follow to achieve a period of more consistent growth in earnings.

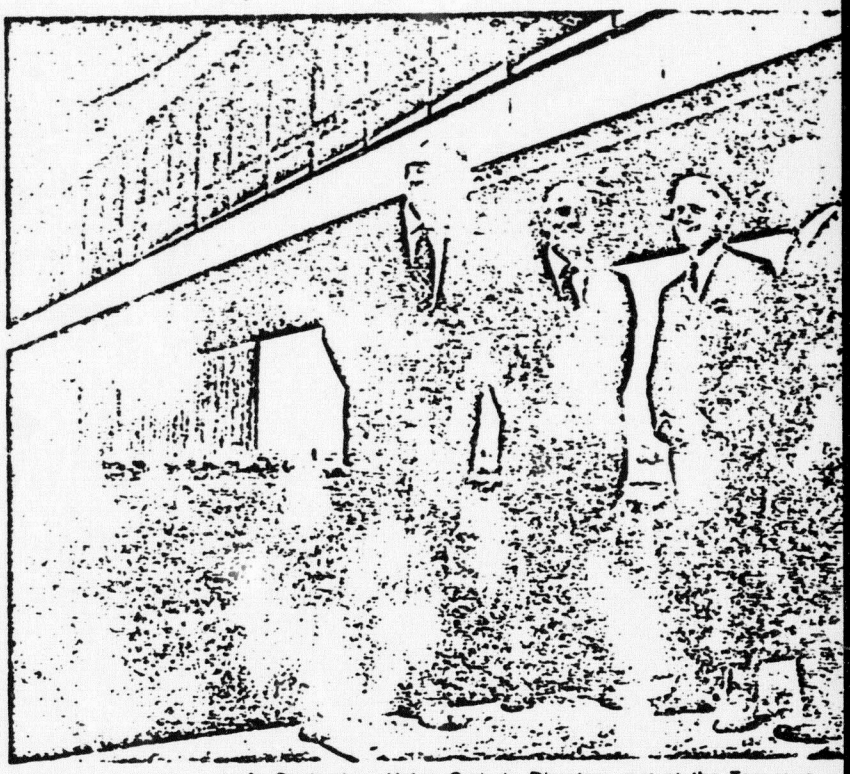
Your management extends its sincere thanks to all employees, directors, and stockholders for their loyal and dedicated support during the past year.

Respectfully submitted,

Chairman of the Board

President

March 12, 1973



In September, Union Carbide Directors met at the Tarrytown, N.Y., Technical Center. Above, members of the Management Committee of the Board—Messrs. Johnstone, Nicholson, Strain, and Wilson—pause on a pedestrian walk near the 1200-foot-long "spine building" linking the north and south sections of the site.

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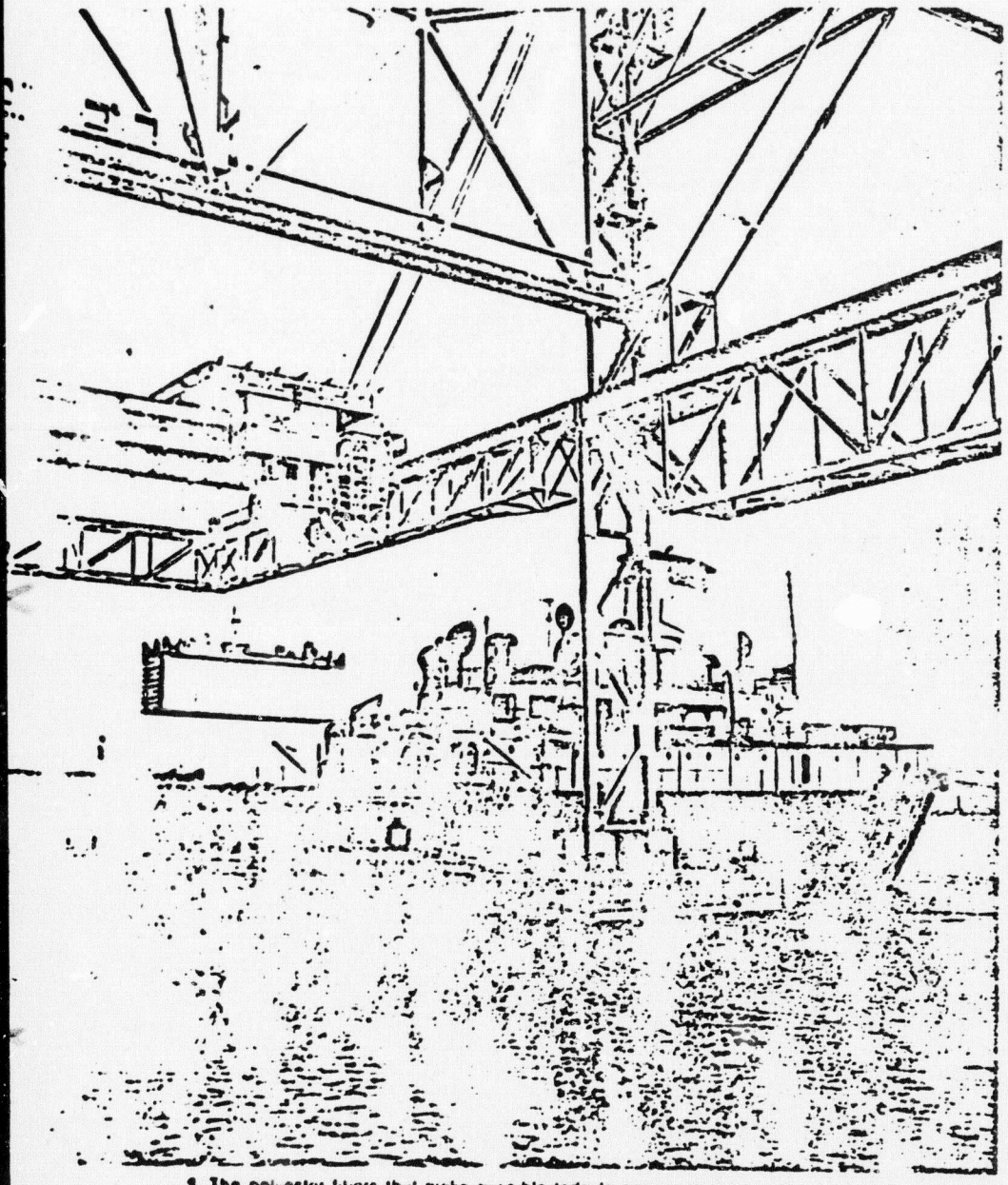
A 5162

Boc RX187-D

A welcome sign-upturn in chemicals and plastics

1



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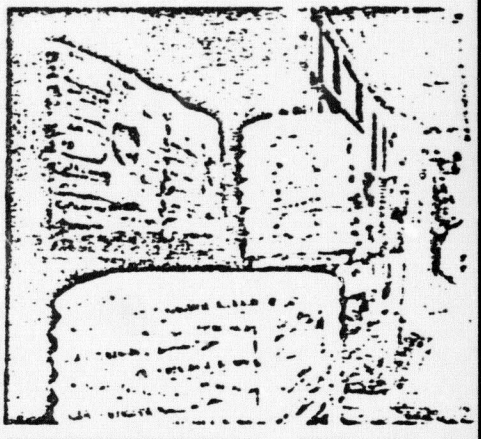


4

1. The polyester fibers that make possible today's easy-care sportswear are a major outlet for Union Carbide's ethylene glycol. The U.S. and export market for this product now exceeds 3.1 billion pounds and is growing at a rate of 9 per cent per year. 2. In 1973, an average of more than 200 million pounds of chemicals a month is expected to be shipped from the Ponce, Puerto Rico, complex. At the new loading dock, a crane lifts aboard ship van boxes filled with polyethylene resins. 3. A growing use for Union Carbide's ZENDEL plastic film is for shrink-wrapping entire pallet loads of a variety of industrial products. This UCAR manganese-aluminum alloy will go into aluminum for can stock and such products as window screens. 4. Early in June, Union Carbide shipped to a Detroit, Michigan, automaker the first tank car of new polymer polyols, specially developed to make more comfortable foam cushioning.

A 5163

Boc Rx 187-

A Review of Union Carbide's Year—1972

As the year 1972 progressed, Union Carbide benefited increasingly from a steady improvement in U.S. business activity, sustained growth in its overseas markets, and higher profitability brought about through excellent plant operations and selective allocation of capital and manpower. Worldwide sales advanced to $3,261 million, a gain of 7 per cent over 1971, with all major product groups showing marked progress. Earnings rose to $205 million, bettering the previous year by 30 per cent.

An accomplishment of considerable significance was the improvement of the chemicals and plastics business. Supported by new and more efficient production facilities, sales grew by 11 per cent worldwide and income contribution doubled from the depressed level of 1971. Markets in the U.S. were very strong, and in the international area the exceedingly good performance of European affiliates was particularly noteworthy.

Despite the high activity in most markets, price erosion continued to depress sales and profits in several major product lines. The Corporation's overall selling prices in the U.S. were in fact slightly lower than in 1971. The metals business was plagued by all-time high imports of ferroalloys; and price pressures also affected the carbon products business. During the first half, the domestic chemicals and plastics price index declined 1½ per cent, but upward price activity was evident in some product lines toward the end of the year. Industrial gas prices also moved upward as supply became tighter.

7 per cent gain in U.S. sales

In the United States, sales were 7 per cent higher than in 1971. Product areas showing the greatest strength were chemicals, plastics, and industrial gases.

The automotive and housing industries continued to be the strongest markets for chemicals and plastics. An important 1972 development was the substantial increase in demand for new proprietary Union Carbide chemicals for making foam automobile sealing (see picture on page 3). Continued good demand for quick-drying, durable house paints helped push latex sales to new highs; and the market growth for low-density polyethylene—a popular plastic for many household items—was at the highest rate of the past four years.

Other major chemicals product areas in which Union Carbide has an excellent position, and which are being strongly supported, are silicones and ethylene oxide and its derivatives—building blocks for hundreds of other chemical products.

Sales of agricultural chemicals were hampered by weather conditions and exports were held back by unsettled political conditions in certain countries. Nevertheless, Union Carbide's new TEMIK pesticide gained increasing acceptance, and shows excellent promise for future growth.

A healthier U.S. steel industry bolstered the on-site gas business. The merchant gas business also continued its strong historical growth aided by emerging new applications, such as food freezing and the cupola production of both iron and mineral wool. Aluminum industry requirements gave impetus to sales increases for silicon and manganese specialty materials. Sales of uranium, primarily to the electric utility industry under long-term contracts, were again satisfactory. The sales of graphite electrodes further increased, as the growth of electric furnace steel (now 18 per cent of the total steel produced) continued at a steady pace.

Because of a low level of activity, the aerospace industry's demands for industrial gases continued to be depressed. Nevertheless, this industry's requirements increased in 1972 for graphite fibers and cloth—high-performance materials for structural components.

The supermarket has become a very important outlet for Union Carbide products. Prominent in the "market basket" are GLAD plastic wrap and bags, EVEREADY batteries, and PRESTONE coolant. The year 1972 was extremely competitive for all three of these product lines, yet each retained its leadership position in the industry. In fact, the growth of the GLAD line outpaced that of the household plastic wrapping materials market. EVEREADY ENERGIZER alkaline batteries continued to be the front-runners in premium battery sales, and rechargeable batteries were in strong demand for new cordless products, such as grass and hedge clippers and portable calculators.

In 1972, motorists took advantage of the year-round pro-

A 5164

Boc Rx 187-F

Strong gains made in European area

1. An inspector checks boxes of GLAD bags on conveyors in Union Carbide Deutschland's new $3.3 million plant at Alsdorf, Germany, which was started up in the first quarter of 1972 to help meet growing demands for the popular GLAD line throughout the European area. 2. One of Britain's largest plastics producers, Bakelite Xylonite Limited markets a broad range of rigid and thermoplastic sheet materials. Here in the Union Carbide affiliate's Manningtree plant, sheets of polyvinyl chloride plastic are given a highly polished surface by pressing them between stainless steel plates. 3. To supply Spain's growing steel industry, Union Carbide Iberica completed in August a $4.6 million expansion of its Gijon gas plant, which doubled its capacity to 1,000 tons of oxygen per day.

tection offered by Union Carbide's new PRESTONE II winter-summer concentrate. Also, LINDE stars and LINDE simulated diamonds generated additional sales through the introduction of the "Birthstar-of-the-Month" program, as well as through jewelry premium and incentive promotions.

International business continues strong

Sales of consolidated overseas subsidiaries were 9 per cent higher than in 1971. However, the increase would have been 14 per cent had it not been for the fact that sales of tin from a smelter in the Far East were included in consolidated sales in 1971 but not in 1972. For details, see footnote on page 12.

In Canada, business in general paralleled that in the United States, with particular strength shown in low-density polyethylene and GLAD products.

Sales of Union Carbide affiliates were strong in most countries in Latin America despite uncertainties caused by political unrest in some countries in the area. The industrial gas business in Brazil was especially strong throughout the year.

An early pickup in the European economy resulted in a truly superior performance in that area, with sales advancing over 15 per cent. All product groups showed good gains — particularly chemicals, plastics, and industrial gases. New facilities provided a springboard for expansion in GLAD products and high-density polyethylene. Other developing new businesses include CELLOSIZE resins for specialty coatings, UNOX wastewater treatment systems, molecular sieve catalysts, and seed tape.

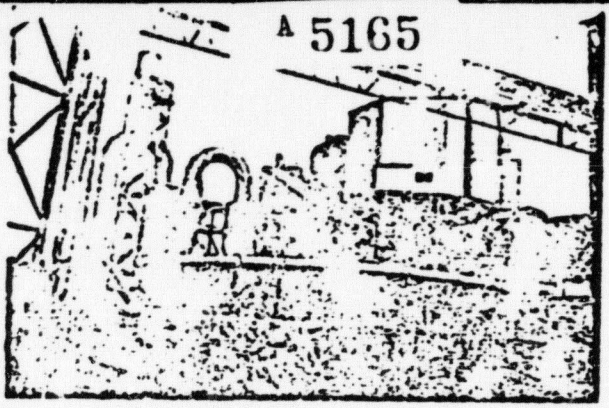
In the Far East, the best performers were affiliates in India and Indonesia. Business in Australia was strong, but Philippine operations were hindered by a devastating flood in mid-year. The general economic slowdown in Japan and the revaluation of the yen had serious adverse effects on Union Carbide joint-venture companies there, and in 1972 these operations were not profitable.

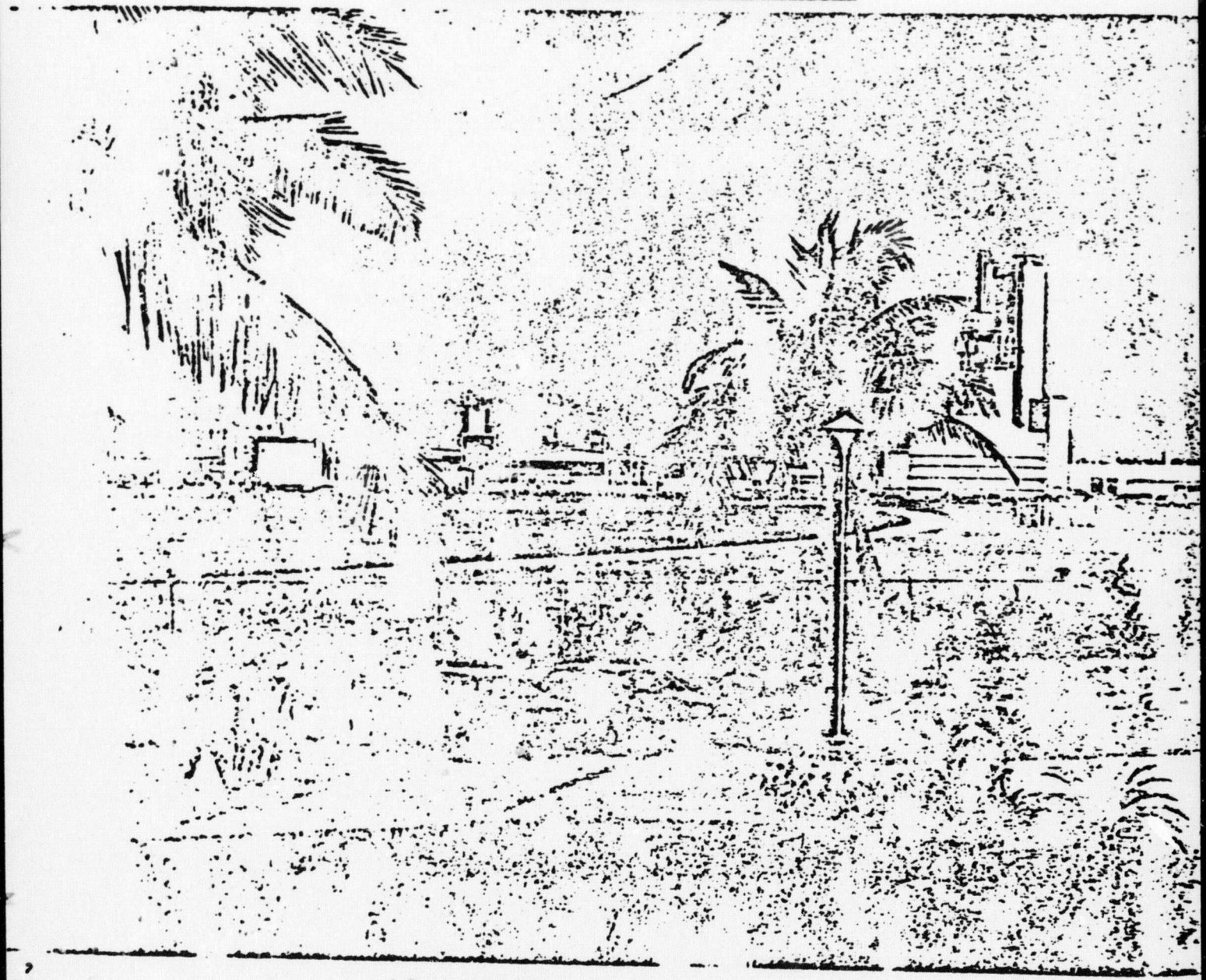
Overall, Union Carbide's business in Africa and the Middle East was on target. Because of sanctions against Rhodesia, in effect since 1966, American industry had been forced to purchase chrome at very high costs from other

A 5165

BOC RX 187-G

..Good plant operations improve profitability



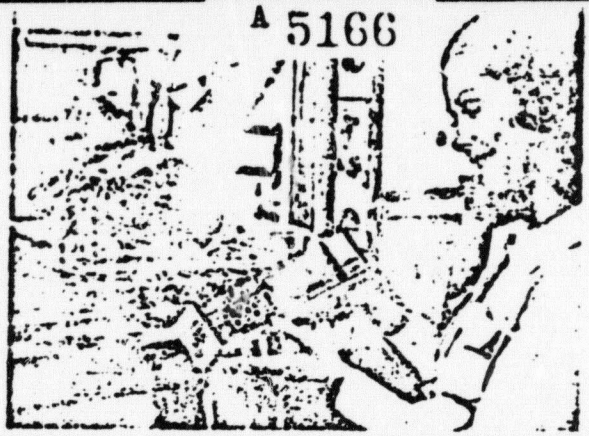


1. First in the U.S. to produce vanadium as a primary product, rather than as a by-product of uranium or phosphate processing, Union Carbide's large mining and milling complex near Hot Springs, Arkansas, operated at high efficiency in 1972 to meet growing vanadium requirements for high-strength steel. 2. In 1972, Union Carbide completed a five-year program for expansion of electrode capacity. This $51 million plant at Yabucoa, Puerto Rico, started operating at full capacity when the last of its planned units went on stream at mid-year.

A 5166

Boc Rx 187-H

Responding to the needs of people



1. The pretty chef is trying out a popular new cooking practice—roasting meat in a GLAD oven bag. She'll find it cooks faster and stays juicier. By discovering a way to heat-seal polyester film, Union Carbide was able to produce a bag with better strength and heat resistance. 2. This six-year-old wants her birthday party remembered, so out comes Kodak's new Pocket Instamatic camera. Into the camera goes Union Carbide's contribution—an EVEREADY Alkaline battery. The specially designed [illegible]olo battery operates the electronic shutter. 3. To speed up beef and dairy herd improvement, many heifers and cows are now bred by artificial insemination. This beef herd owner is withdrawing an ampul of semen from one of LINDE's specially designed liquid nitrogen refrigerators, in which it can be stored almost indefinitely. 4. Students at New York City's George Washington High School spend a hot summer day cleaning up the school grounds under the guidance of Thomas W. Watkins, who returned in October to his job at Union Carbide after a year's service on a business team working with young people.

BOC Rx 187-I

countries, primarily the Soviet Union. This led to the passage of the Byrd Amendment in late 1971, which allowed imports of strategic materials from Rhodesia. Accordingly, Union Carbide and other American companies were permitted to receive shipments of chrome from that country in 1972. Chromium is essential to the manufacture of stainless steel and super-alloys, which are of critical importance to the nation's security and economic well-being.

Several operations discontinued

As a result of the continuing reappraisal of the potential of its various businesses, the Corporation in 1972 disposed of several operations that did not fit into its overall pattern for growth. These included a military laser business, a plastic container business, the nonwoven segment of the fibers and fabrics business, and a number of marginal operations. During the last five years, the Corporation has sold or discontinued operations that had sales of approximately $150 million in 1968.

Outstanding plant performance

A major factor in the year's good results was excellent plant operations around the world.

Although the new Ponce petrochemicals facility was described by its builders as the most complex job they had ever undertaken, the project was finished ahead of schedule and within budget. It was the petrochemicals industry's largest single project, capable of producing 4 billion pounds of products per year. The start-up of this plant was considered one of the most trouble-free in the industry in recent years, and the plant has operated at rates in excess of design capacity. The Ponce complex is expected to generate earnings in 1973 of from 20 to 25 cents a share.

Other good plant start-ups in 1972 were those of two new high-density polyethylene plants utilizing proprietary Union Carbide technology—one in Sweden and the other in Australia; the GLAD products plant in Alsdorf, Germany; and the world's largest silicon metal furnace in Norway.

Union Carbide's plant operations throughout the world were generally good, and increased levels of efficiency helped to offset higher costs for raw materials, labor, and environmental protection programs. An exception was the olefins section of the chemicals plant in Cubatao, Brazil, where, in spite of some improvement, difficulties continued throughout the year.

Key areas of development

A major area in which Union Carbide is making an important contribution and meeting a real need is in wastewater treatment. The UNOX system—a patented system using oxygen to stimulate the growth of waste-consuming bacteria—has made exceptional progress in gaining worldwide acceptance since its introduction three years ago. At the end of the year, 5 installations were already in operation, 7 more under construction, and more than 30 under design. To expedite the availability of the system on a worldwide basis, Union Carbide has made arrangements for other companies to use its patented technology. For example, a license was granted to a U.S. company; a tentative agreement was signed with a British firm to establish a subsidiary in the United Kingdom; and a joint-venture company was formed in Japan.

A foundation for future corporate growth and diversification is being laid by investing a significant part of the Corporation's research and development expenditures in new enterprises that fall outside the scope of established businesses. This activity is taking Union Carbide into such areas as medical instruments, fish farming, and advanced agricultural systems. Commercial progress also continues to be made in plastic papers, radiodiagnostic agents, and UCAR rapid water for fire fighting.

Late in the year, Union Carbide along with two other major companies – Westinghouse Electric and Bechtel Corporation—announced plans for a study program to explore the feasibility of constructing the first privately owned uranium enrichment facility in the United States. As presently conceived, this facility would increase the U.S. enrichment capacity by approximately one third, and would require an investment of about $2 billion.

Responding to the public interest

Union Carbide is committed to build and maintain a profitable, growing, worldwide enterprise that seeks, encourages, and develops excellence in people and excellence in performance, and provides products and services of value to customers and the public. In so doing, the Corporation is dedicated to the fulfillment of its obligation of good citizenship worldwide. The management of the Corporation, aided by the Public Policy Committee of the Board, which was formed in 1972, periodically reviews and implements plans for progress in such areas as safety and health, environmental affairs, aid to education, charitable contributions, employment of women and minorities, urban affairs, government relations, and relations with consumers and the general public.

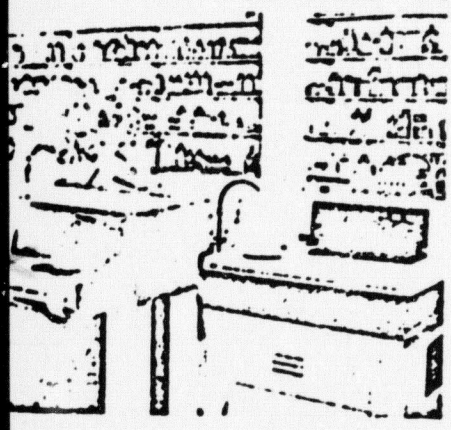
Programs are continuing at major plant locations to make operations environmentally clean. Union Carbide plants are currently in compliance with emission-control schedules set by state or federal authorities in the U.S.

A 5168

Boc Rx 187-J

...New businesses doing well

1



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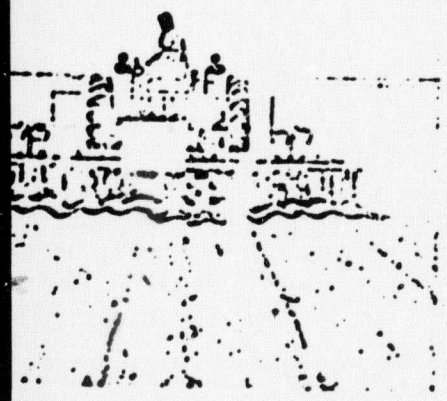

3

1. Visitors to Union Carbide's booth at the American home economists convention in June sampled tasty pan-size salmon harvested at the Puget Sound (Washington) fish farm of Domsea Farms, Inc., a Corporation subsidiary. 2. Over 50 systems incorporating Union Carbide's CENTRIFICHEM high-speed blood serum analyzer are now in operation throughout the world. A contract was recently signed with a leading pharmaceutical firm for marketing the system in Europe. 3. Union Carbide's seed tape is used by growers for precision planting of vegetable crops, such as cucumbers. It is expected that by 1975, almost 500,000 miles of seed tape will have been planted in the United States.

The new chemicals plant at Ponce, Puerto Rico, which incorporates $13.8 million in waste prevention and treatment facilities, is one of the best equipped in the world from the standpoint of environmental protection. In 1972, the Corporation spent more than $28 million for pollution-abatement facilities and equipment in the United States and Puerto Rico alone, and expects to spend $150 to $175 million in the next five years. In addition, the Corporation anticipates making substantial outlays through 1985 as a result of new water-quality requirements recently imposed by the federal government.

The Corporation has also been finding ways to enable others to solve their environmental problems. In 1972, three new air pollution-control processes were introduced for industrial use. Two of them enable nitric and sulfuric acid producers to reduce the level of their most troublesome emissions to as little as 1/15 of that permitted under the U.S. Government's new standards for the two industries. The third will help chlorine producers meet proposed new federal emission standards for mercury (see installation pictured on page 1).

Organization and people

While development of physical and financial resources is naturally vital to the well-being of a company, Union Carbide realizes that people within the Corporation must understand and be motivated toward corporate goals and commitments if it is to achieve its full potential in growth and profitability. Accordingly, during 1972, a program was launched aimed at the development of a unified, global management system placing greater emphasis on training key personnel to become professional managers. While this is a long-term commitment to management excellence, near-term improvements are already evident.

In line with concepts of the new management system, a number of organizational moves were announced in 1972 that became effective January 1, 1973. Three Executive Vice-Presidents were elected. Each is responsible for the management of a combination of United States and international operations. At the same time, several businesses were realigned to recognize their interdependence with other product lines.

During the year, both Chairman Wilson and President Sneath visited Union Carbide's African operations to review progress being made in providing better employment opportunities, housing, and education. From the beginning of its involvement in this area, Union Carbide has worked to improve the quality of life for its black employees. In some of these developing countries, ownership is shared with local interests.

BOC RX187-K

While the safety performance of the Corporation and its employees has consistently compared favorably with the record for industry generally, 1972 was a year of particular achievement. For example, the rate of disabling injuries in domestic operations was reduced to an all-time low.

Labor relations in 1972 were generally good. The few work stoppages that occurred were settled on a satisfactory basis.

Equal employment opportunity is a principle to which Union Carbide continues to be committed. At its business locations throughout the U.S., affirmative action programs have been written that include an analysis of the work force at each location and specific detailed plans aimed at encouraging increased hiring and promotion of qualified women and minority group members. As a result, even though the Corporation's overall work force in the U.S. has declined during the last several years, improvement in job opportunities for both women and minorities is generally evident. The Corporation recognizes that proper utilization of all its human resources is both desirable and economically beneficial, and equal employment opportunity is an integral part of this principle.

Some external influences on business

The Corporation's profit margin in the United States in 1972 was within the limits established by the Price Commission. The modifications in the control program embraced in the announcement of Phase 3 should enable Union Carbide to benefit from more efficient operating methods. It is essential to avoid profit margin limitations that could make it impossible to realize such benefits and thereby, in the long run, seriously handicap American industry in efforts to restore earnings to the level necessary to expand and create new job opportunities.

For some time, Union Carbide has been concerned about the increasing imbalance in labor-management relations, which it feels is one of the major factors contributing to inflation. Accordingly, Union Carbide has joined with other leading companies in bringing to the attention of Congress the critical need for labor law reform, which would help make the United States more competitive in worldwide markets.

Recently, there has been considerable agitation from various sources, including some labor unions, for legislation to curtail the operations of multinational companies. Late in 1972, Union Carbide released a study that clearly demonstrates that the Corporation's foreign investments benefit rather than weaken the U.S. economy. Similar findings have been reached not only by other major corporations but by a number of independent agencies as well. The Union Carbide study, which covers 20 years of operations, shows that in this period the Corporation's U.S. exports increased nearly sevenfold—from $38 million in 1951 to $253 million in 1970. Moreover, nearly 2,000 additional export-related jobs in the U.S. are directly related to the Corporation's foreign investments. In the five-year period, from 1968 to 1972, the Corporation's contribution to the U.S. balance of payments was almost $1 billion.

A matter of growing importance to Union Carbide is the cost and availability of hydrocarbon raw materials for manufacturing chemicals and plastics. The chemical industry has waged a lengthy uphill struggle to gain recognition of its need for access to competitively priced feedstocks from abroad. This effort received encouragement with the establishment by the federal government of a petrochemicals access program last May. However, the success of the program could be jeopardized by proposals for using petrochemicals feedstocks to satisfy natural gas demands. Union Carbide has been working closely with governmental agencies and with others in the industry to encourage the development of future supplies of natural gas and to ensure that petrochemicals producers will receive an equitable, adequate, and economical supply of the hydrocarbon raw materials they need.

At the same time, as a large user of power, the Corporation has stressed the necessity for taking full advantage of all major fossil fuel reserves. It has urged that the federal government increase its support of programs in coal gasification and fuel desulfurization, and also that it move—both legislatively and administratively—to overcome the barriers impeding the construction and operation of nuclear power plants.

Financial picture is strong

As the balance sheet indicates, the financial condition of Union Carbide is strong. The Corporation's cash position was strengthened during 1972, and at year-end there was no short-term debt in the United States. Certain pollution-control facilities in the U.S. are being financed through tax-exempt industrial development revenue bonds. Other than this, and possible financing abroad that may be required to comply with regulations governing direct foreign investments, there are no plans for major new long-term financing in 1973.

During 1972, both the Board of Directors and its Audit Committee met with the Corporation's financial officers and its independent public accountants to review, among other things, accounting policies and practices and the adequacy of internal controls.

A 5170

BOC Rx 187-L

Financial Review

Domestic (United States and Puerto Rico) and International Contributions to Consolidated Sales and Net Income

Sales

	1972 Millions of Dollars	1972 Per Cent of Total	1971 Millions of Dollars	1971 Per Cent of Total	Per Cent Change 1972 vs. 1971
Domestic Operations	$2,270.5	70	$2,130.7	70	+ 7
International Operations	990.8	30	906.8	30	+ 9
Total UCC Consolidated	$3,261.3	100	$3,037.5	100	+ 7

Net Income*

	1972 Millions of Dollars	1972 Per Share	1972 Per Cent of Total	1971 Millions of Dollars	1971 Per Share	1971 Per Cent of Total	Per Cent Change 1972 vs. 1971
Domestic Operations	$142.3	$2.34	69	$113.1	$1.87	72	[illegible]
International Operations	62.9	1.04	31	44.7	0.74	28	+41
Total UCC Consolidated	$205.2	$3.38	100	$157.8	$2.61	100	+30

Consolidated Sales and Income Contributions by Lines of Business

	Sales (Millions of Dollars) 1972	Sales (Millions of Dollars) 1971	Income Contributions (Millions of Dollars) 1972	Income Contributions (Millions of Dollars) 1971
Chemicals and Plastics	$1,358	$1,221	$127	$ 63
Gases and Related Products, Metals and Carbons, and Materials Systems	1,170	1,121	147	125
Consumer and Related Products	733	696	104	101
	$3,261	$3,038	$378	$289

Consolidated Sales by Major Classes of Products

	1972 Millions of Dollars	1972 Per Cent of Total	1971 Millions of Dollars	1971 Per Cent of Total	Per Cent Change 1972 vs. 1971
Chemicals	$ 906	28	$ 823	27	+10
Plastics	452	14	398	13	+14
Gases and Related Products	439	14	396	13	+11
Metals and Carbons	652	20	654	22	–
Materials Systems	79	2	71	2	+11
Consumer and Related Products	733	22	696	23	+ 5
	$3,261	100	$3,038	100	+ 7

Consolidated Sales and Income Per Share by Quarter

	Sales (Millions of Dollars) 1972	Sales (Millions of Dollars) 1971	Income Before Extraordinary Items Per Share 1972	Income Before Extraordinary Items Per Share 1971	Net Income Per Share 1972	Net Income Per Share 1971
1st Quarter	$ 759.6	$ 748.1	$0.82	$0.72	$0.84	$0.72
2nd Quarter	810.1	770.9	0.86	0.67	0.89	0.67
3rd Quarter	817.3	749.5	0.76	0.47	0.78	0.54
4th Quarter	874.3	769.0	0.98	0.67	0.89	0.66
	$3,261.3	$3,037.5	$3.42	$2.53	$3.38	$2.61

*Net income includes extraordinary items as follows:

	1972 Millions of Dollars	1972 Per Share	1971 Millions of Dollars	1971 Per Share
Domestic Operations	$(.5)	$(0.01)	$9.2	$0.15
International Operations	(1.7)	(0.03)	(4.4)	(0.07)
Total UCC Consolidated	$(2.2)	$(0.04)	$4.8	$0.08

A 5171

Boc RX187-m

Domestic Sales by Markets

	Per Cent	
	1972	1971
Chemicals and Allied Products	21	21
Primary Metal Industries	19	20
Rubber and Misc. Plastics Products	12	10
Food and Kindred Products	4	4
Machinery	4	4
Transportation Equipment	3	2
Petroleum and Coal Products	2	2
Other Manufacturing	5	6
Total Manufacturing	70	69
Wholesale and Retail	24	23
Agriculture	2	3
Public Administration	2	2
All Other	2	3
	100	100

Domestic customer sales have been classified by the Standard Industrial Classification according to the customer's immediate use. 1971 has been restated to conform with this new classification.

Domestic Price Index

	1972	1971
Basis: 1957-1959 average = 100	79	79

Employees

	Year-End	
	1972	1971
Domestic Operations	51,179	52,906
International Operations	46,935	46,275
Total UCC Consolidated	98,114	99,181
The foregoing figures do not include the following:		
Employees at nuclear energy installations operated for the U.S. Government at Oak Ridge, Tenn., and Paducah, Ky.	15,072	15,036
Employees of companies 20 to 50 per cent owned	13,351	13,053

	Millions of Dollars	
	1972	1971
Total domestic employment costs (excluding those at government-owned facilities)	$690.7	$685.6

Taxes

	1972	1971
Effective U.S. and foreign income tax rate	41.3%	43.1%

For additional information regarding investment tax credit, see Note 8 on page 17.

Construction Expenditures

	Millions of Dollars	
	1972	1971
United States and Puerto Rico	$158	$249
Europe	18	31
Pan America (includes Canada)	43	30
Far East	20	12
Africa and Middle East	5	13
Total Consolidated Companies	$244	$335
Companies 20 to 50 per cent owned	$ 32	$ 52

Financing

In 1972, the Corporation replaced a previously existing $300 mill revolving credit agreement with line of credit arrangements for t same amount, thereby eliminating a commitment fee of one hal one per cent per annum.

The Corporation made use of domestic short-term credit duri the first half of 1972 through bank credit and through the sale commercial paper fully backed by bank lines of credit. At the e of 1972, the Corporation had no domestic short-term debt ou standing, and held a domestic portfolio of short-term high-gra securities amounting to $133 million.

Short-term borrowings shown on the consolidated balance she include the following:

	Millions of Dollars	
	Dec. 31, 1972	Dec. 31, 197
Domestic	$ —	$ 13.8
International	68.8	92.0
Total	$68.8	$105.8

In January 1973, the Corporation arranged to finance certain pol tion-abatement facilities at its plants at Alloy and Sistersville, We Virginia, through industrial development revenue bonds in th amount of $29.5 million.

International Balance of Payments

In 1972, Union Carbide again had a favorable balance of payment amounting to $201 million, compared with $212 million in 1971. Principal contributing factors are tabulated below:

	Millions of Dollars	
	1972	1971
Exports from the U.S. and Puerto Rico		
To Customers	$126	$114
To Subsidiaries	141	148
Total Exports	$267	$262
Net Dividends from International Affiliates	$ 21	$ 22

The foregoing discussions in this Financial Review section do not include sales of companies 20 to 50 per cent owned; however, income data include UCC's share of the income contributions are before provision for income taxes, minority stockholders' share of income, UCC's share of income of 20 to 50 per cent owned comp and extraordinary items. For further details, see Notes 1, 2, and 9 on pages 16 and 18.

In July 1971, the Corporation reduced its interest in a tin smelter in the Far East from a majority position to 50 per cent, as a result of which its sales, which amounted to $74 million in the first half of 1971, were thereafter excluded from consolidation. If adjustment is made to eliminate these sales, the gain in international sales from 197 to 1972 amounts to 14 per cent.

A 5172

Boc Rx 187-N

Consolidated Statement of Income and Retained Earnings
Union Carbide Corporation and Subsidiaries

	Millions of Dollars (Except Per Share Figures) Year Ended Dec. 31, 1972	Year Ended Dec. 31, 1971
Net Sales	$3,261.3	$3,037.5
Deductions		
Plant Cost and Distribution Expense	2,169.8	2,044.2
Research and Development	69.6	78.3
Selling, General, and Administrative Expenses	348.4	343.2
Depreciation and Depletion	245.2	229.3
	2,833.0	2,695.0
Income from Operations	428.3	342.5
Other Income—Net	5.6	7.3
Less: Interest on Long- and Short-Term Debt	56.1	60.9
Income Before Provision for Income Taxes	377.8	288.9
Provision for Income Taxes		
Current	136.6	96.9
Deferred	19.6	27.7
Total	156.2	124.6
Income Before Minority Stockholders' Share of Income and UCC Share of Income of Companies Carried at Equity	221.6	164.3
Less: Minority Stockholders' Share of Income	18.0	15.7
	203.6	148.6
Plus: UCC Share of Income of Companies Carried at Equity	3.8	4.4
Income Before Extraordinary Items	207.4	153.0
Per Share*	$3.42	$2.53
Extraordinary Items—Net of Tax	(2.2)	4.8
Per Share*	$(0.04)	$0.08
Net Income	205.2	157.8
Per Share*	$3.38	$2.61
Retained Earnings at January 1	1,533.9	1,496.6
Adjustments	.2	.6
	1,739.3	1,655.0
Dividends Declared	121.3	121.1
Retained Earnings at December 31	$1,618.0	$1,533.9

*Based on 60,659,016 shares (60,538,572 shares in 1971), the average number of shares outstanding during the year.

The Notes to Financial Statements on pages 16 through 18 are an integral part of this statement.

A 5173

Boc Rx 189-0

Consolidated Balance Sheet
Union Carbide Corporation and Subsidiaries

Assets	Millions of Dollars Dec. 31, 1972	Dec. 31, 197
Current Assets		
Cash	$ 99.7	$ 71.8
Time Deposits and Short-Term Marketable Securities	161.9	42.9
	261.6	114.7
Notes and Accounts Receivable	576.9	513.2
Inventories	743.2	756.1
Prepaid Expenses	46.5	45.8
TOTAL CURRENT ASSETS	1,628.2	1,429.8
Fixed Assets	1,953.9	1,987.0
Investments and Advances		
Companies Carried at Equity	76.0	65.8
Other	8.2	6.2
Other Assets	52.0	65.9
	$3,718.3	$3,554.7

Liabilities and Stockholders' Equity		
Current Liabilities		
Accounts Payable	$ 158.6	$ 137.7
Short-Term Borrowings	68.8	105.8
Payments due within one year on Long-Term Debt	57.1	32.3
Accrued Income and Other Taxes	142.4	118.9
Other Accrued Liabilities	203.9	164.4
TOTAL CURRENT LIABILITIES	630.8	559.1
Deferred Credits	117.5	108.2
Long-Term Debt	901.1	915.9
Minority Stockholders' Equity in Consolidated Subsidiaries	135.3	127.2
UCC Stockholders' Equity	1,933.6	1,844.3
	$3,718.3	$3,554.7

The Notes to Financial Statements on pages 16 through 18 are an integral part of this statement.

A5174

BOC Rx 187-P

Consolidated Statement of Changes in Financial Position
Union Carbide Corporation and Subsidiaries

	Millions of Dollars	
	Year Ended Dec. 31, 1972	Year Ended Dec. 31, 1971
Working Capital at Beginning of Year	$870.7	$789.3
Additions		
Operations		
Income before Extraordinary Items	207.4	153.0
Depreciation and Depletion	245.2	229.3
Deferred Income Taxes—Noncurrent	15.4	23.8
Minority Stockholders' Share of Income	18.0	15.7
Working Capital Provided from Operations Exclusive of Extraordinary Items	486.0	421.8
Extraordinary Items		
Income (Loss) from Extraordinary Items	(2.2)	4.8
Reversal of Deferred Income Taxes—Noncurrent	(3.6)	(10.9)
Working Capital Provided from Operations and Extraordinary Items	480.2	415.7
Decrease in Long-Term Receivables	4.6	18.5
New Financing		
Long-Term Debt	42.0	23.1
Preferred Stock Issued by a Consolidated Subsidiary	—	30.0
Other	5.2	4.8
Disposals of Net Fixed Assets		
Included in Sale of a Petroleum Subsidiary	—	77.6
Other	31.9	15.8
	563.9	585.5
Deductions		
Dividends Paid	121.3	121.1
Construction Expenditures	243.9	335.2
Reduction in Long-Term Debt	58.1	32.5
Other—Net	13.9	15.3
	437.2	504.1
Increase in Working Capital	126.7	81.4
Working Capital at End of Year	$997.4	$870.7
Detail of Increases (Decreases) in Working Capital		
Cash and Time Deposits and Short-Term Marketable Securities	$146.9	$(51.9)
Receivables	63.7	(12.6)
Inventories	(12.9)	48.9
Prepaid Expenses	.7	(7.9)
Accounts Payable	(20.9)	8.5
Short-Term Borrowings	37.0	123.4
Other Current Liabilities	(87.8)	(27.0)
	$126.7	$81.4

The Notes to Financial Statements on pages 16 through 18 are an integral part of this statement.

A 5175 Boc Rx 187-Q

Notes to Financial Statements—1972
Union Carbide Corporation and Subsidiaries

1. Summary of Significant Accounting Policies

Principles of Consolidation—The consolidated financial statements include the assets, liabilities, revenues, and expenses of all significant subsidiaries. Investments in significant companies 20 to 50 per cent owned are carried at equity in net assets, and Union Carbide's share of their earnings is included in the income statement. Intercompany transactions have been eliminated. Other investments are carried at cost or less.

Translation of Foreign Currencies—Accounts carried in foreign currencies are translated into U.S. dollars as follows: (a) fixed assets, intangibles, investments, and deferred credits at historic rates; (b) other assets and liabilities at year-end rates (In 1971, inventories were translated at historic rates. The effect of the change to year-end rates in 1972 is not material); (c) income and expenses at monthly rates, except for depreciation and amortization of those balance sheet accounts translated at historic rates. Gains and losses resulting from exchange rate fluctuations are credited or charged to income currently, except that in the case of major currency revaluations or devaluations, adjustments arising from the translation of long-term debt are amortized over the remaining terms of the loans.

Marketable Securities—Marketable securities are carried at cost, which approximates market.

Inventories—Inventory values are stated at cost or market, whichever is lower. Cost is determined generally on the "last-in, first-out" method for United States companies and the "average cost" method for subsidiaries operating outside the United States.

Fixed Assets and Depreciation—Fixed assets are carried at cost. Expenditures for replacements are capitalized, and the replaced items are retired. Maintenance and repairs are charged to operations. Gains and losses from the sale of property are reflected in income.

Depreciation is calculated on a straight-line basis utilizing the 1962 Internal Revenue Service guideline lives with respect to depreciable assets acquired subsequent to January 1, 1967. Prior to 1967, the parent company and certain subsidiaries used accelerated depreciation methods for both published reports and income tax purposes. The Corporation and its subsidiaries continue to use other depreciation methods for tax purposes where appropriate.

Research and Development—Research and development costs are charged to expense as incurred.

Income Taxes—Provision has been made for deferred income taxes where differences exist between the time in which transactions, principally relating to depreciation, affect taxable income and the time in which they enter into the determination of income in the financial statements.

The investment tax credit is amortized over the life of the related assets by reductions in the provision for income taxes.

Retirement Program—The retirement program of Union Carbide Corporation covers substantially all United States employees and certain employees in other countries. Accrued costs under the United States retirement program are funded for all employees age 25 and over, with prior service costs being amortized over a period not exceeding 40 years. Costs of funded and unfunded pension plans of consolidated subsidiaries are accounted for substantially on an accrual basis.

Net Income Per Share—Net income per share is computed based upon the average number of shares of common stock outstanding in each year. There would have been no material dilutive effect upon net income per share for 1972 or 1971 if convertible securities had been converted and if stock options granted had been exercised.

2. International Operations

The following is a financial summary of consolidated international subsidiaries and international companies carried at equity:

	Millions of Dollars			
	Year Ended Dec. 31, 1972		Year Ended Dec. 31, 1971	
	Consolidated Subsidiaries	Companies Carried at Equity	Consolidated Subsidiaries	Companies Carried at Equity
Total Assets	$1,171.2	$362.5	$1,066.3	$343.5
Less: Total Liabilities	479.3	234.2	440.6	222.3
Net Assets	691.9	128.3	625.7	121.2
UCC Equity	$ 588.6	$ 63.8	$ 531.7	$ 60.1
Net Sales	$ 990.8	$434.4*	$ 906.8	$334.1*
Net Income	$ 75.0**	$ 6.8	$ 55.1**	$ 6.6**
UCC Share	$ 59.6**	$ 3.3	$ 41.4**	$ 3.3**

*Exclusive of $9.8 million net sales to UCC and its consolidated subsidiaries in 1972 ($7.0 million in 1971).

**In 1972, a wholly owned consolidated subsidiary incurred a net charge of $2.0 million, or $0.03 per share, resulting from a write-off related to fixed assets. In 1971, consolidated subsidiaries includes a net charge of $3.9 million (UCC share $3.8 million, or $0.06 per share); and companies carried at equity includes a net charge of $3.1 million (UCC share $1.6 million, or $0.03 per share) resulting from major revaluations and devaluations of a number of foreign currencies. A company carried at equity had a gain of $2.0 million (UCC share $1.0 million, or $0.02 per share) from sales of real estate. The UCC share of these amounts has been included in extraordinary items.

3. Supplementary Balance Sheet Detail

	Millions of Dollars	
	December 31, 1972	1971
Notes and Accounts Receivable		
Trade	$ 533.3	$ 452.2
Other	54.2	70.8
	587.5	523.0
Less: Allowance for Doubtful	10.6	9.8
	$ 576.9	$ 513.2
Inventories		
Raw Materials and Supplies	$ 199.0	$ 206.5
Work in Process	180.8	185.8
Finished Goods	363.4	361.8
	$ 743.2	$ 756.1
Fixed Assets		
Land and Improvements	$ 268.4	$ 245.9
Buildings	608.2	606.9
Machinery and Equipment	3,683.6	3,403.7
Construction in Progress and Other	169.4	473.8
	4,729.6	4,730.3
Less: Accumulated Depreciation and Amortization	2,775.7	2,743.3
	$1,953.9	$1,987.0

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3. Supplementary Balance Sheet Detail (continued)

	Millions of Dollars, December 31, 1972	1971
Other Assets		
Deferred Charges	$ 22.7	$ 28.8
Long-Term Receivables	23.0	27.6
Patents, Trade Marks, and Goodwill	6.3	9.5
	$ 52.0	$ 65.9
Deferred Credits		
Income Taxes*	$ 99.3	$ 95.1
Investment Tax Credit	9.6	2.0
Other	8.6	11.1
	$ 117.5	$ 108.2

*Deferred income taxes related to current items are included in accrued income and other taxes in the amount of $25.3 million in 1972 ($21.0 million in 1971).

4. Long-Term Debt

	Millions of Dollars, December 31, 1972	1971
UNION CARBIDE CORPORATION AND DOMESTIC SUBSIDIARIES		
3.50% Notes due semiannually to 1984	$180.0	$195.0
4.50% Notes due semiannually to 1996	47.0	48.9
3.625% Notes due semiannually to 1990. Issued at a discount to yield lenders 4.50% per annum over the term of the notes	45.0	47.5
4.50% Notes due annually, 1985 to 1994	200.0	200.0
4.75% Guaranteed Debentures due 1982. Convertible into Union Carbide Corporation Common Stock at $56.50 per share	50.0	50.0
5.30% Sinking Fund Debentures. Equal annual sinking fund payments, 1978 to 1997	250.0	250.0
6.80% and 6.60% Notes, payable in Belgian francs, renewable annually to 1975	45.0	44.0
5.3125% Loan payable in Deutsche marks, due 1973, to refinance 7.25% Loan	18.4	18.4
Loan at 3.00% above the Bundesbank rate, payable in Deutsche marks, due 1976	6.0	4.9
INTERNATIONAL SUBSIDIARIES Various maturities and interest rates	118.8	89.5
	$958.2	$948.2
Less: Payments due within one year (included in current liabilities)	57.1	32.3
	$901.1	$915.9

International subsidiaries' debt includes $39.5 million due in United States dollars and $77.3 million representing the amount due in other currencies; $34.9 million is secured by pledges or liens on $133.8 million of international consolidated assets.

Payments due on long-term debt in the four years after 1973 are: 1974, $32.1 million; 1975, $78.7 million; 1976, $31.4 million; 1977, $29.6 million.

A revolving credit agreement under which the Corporation could borrow a maximum of $300 million on 90-day renewable notes was replaced in 1972 with line of credit arrangements in the same amount and, as a result, a commitment fee of ½ of 1 per cent per annum was eliminated. At December 31, 1972, there were no outstanding borrowings under these arrangements.

In January 1973, the Corporation entered into leases with two counties in West Virginia for pollution-abatement facilities to be financed through the issuance of 5.20 per cent industrial development revenue bonds unconditionally guaranteed by the Corporation totaling $29.5 million. Mandatory redemption of these bonds starts in 1989, with final payment in 1998. For accounting and tax purposes, these facilities will be treated as an acquisition and these lease obligations will be included in long-term debt.

5. UCC Stockholders' Equity

Capital Stock

Authorized—Preferred Stock .....$1.00 par value.....10,000,000 shares
Common Stock .....$1.00 par value.....90,000,000 shares

	Dollars in Millions, Dec. 31, 1972 Shares	Amount	Dec. 31, 1971 Shares	Amount
Issued—Preferred	none	—	none	—
Common	61,424,156	$ 322.9	61,277,236	$ 317.8
Retained Earnings		1,618.0		1,533.9
		$1,940.9		$1,851.7
Less: Treasury Common Stock Held by the Corporation	691,757	7.3	709,510	7.4
	60,732,399	$1,933.6	60,567,726	$1,844.3

Issued shares include 80,255 shares at December 31, 1972 (44,366 shares at December 31, 1971), held by the Corporation as collateral under employee stock purchase agreements. The amount to be paid under these agreements, $3.4 million at December 31, 1972 ($1.9 million at December 31, 1971), has been deducted from common stock (Note 10). During 1972, 67,520 shares were issued under employee stock option plans; 1,500 shares were reacquired, canceled, and restored to authorized and unissued common stock; and 80,900 shares were issued and purchased at market price by the Trustee under the Union Carbide Corporation Employees' Savings Plan.

Also, during 1972, 20,000 shares of treasury common stock were issued in a pooling of interests transaction, with appropriate adjustment to retained earnings; and 2,247 shares were reacquired as treasury common stock.

6. Lease Commitments

Commitments under noncancelable leases, extending for one year or longer, involving primarily distribution equipment, offices, and warehouse space, required payments of $26.2 million in 1972 and will require $23.8 million in 1973, with diminishing amounts thereafter.

7. Retirement Program

The retirement program cost for 1972, including the cost of funded and unfunded pension plans of consolidated international subsidiaries, which are accounted for substantially on an accrual basis, amounted to $46.0 million. The corresponding amount for 1971 was $44.5 million. Plan funds exceed the actuarial liability for benefits vested with employees.

8. Income Taxes

Under the Revenue Act of 1971, the investment tax credit applicable to certain depreciable assets placed in service in the United States

in 1972 amounted to $8.5 million ($2.2 million in 1971). This amount is being amortized over the life of the related assets by reductions in the provision for income taxes.

Consolidated retained earnings include undistributed earnings of affiliates accumulated over many years of approximately $400 million after applicable income taxes provided by these affiliates. The Corporation has determined that no additional provision for taxes is required since these earnings have been or will be reinvested indefinitely.

9. Extraordinary Items

Extraordinary items in 1972 consist of (a) nonrecurring net gains aggregating $6.7 million (after applicable tax of $3.6 million), or $0.11 per share, resulting from sales of businesses and other property, including $3.9 million, or $0.06 per share, from sale of a power station; and (b) nonrecurring net charges of $8.9 million (after applicable tax of $5.3 million), or $0.15 per share, resulting principally from abnormal property retirements, including $4.9 million, or $0.08 per share, from a write-off related to coal properties.

Extraordinary items in 1971 consist of (a) nonrecurring net gains aggregating $12.2 million (after applicable tax of $3.4 million), or $0.20 per share, resulting from sales of businesses and real estate, including $7.7 million, or $0.13 per share, from sale of a petroleum subsidiary; and (b) nonrecurring net charges of $7.4 million (after applicable tax of $1.3 million), or $0.12 per share, resulting from major revaluations and devaluations of a number of foreign currencies in the amount of $5.4 million, or $0.09 per share, and from write-offs relating to fixed assets.

10. Incentive Programs

In 1965, the stockholders approved the 1965 Stock Option Plan. Previously in 1959, the Union Carbide Incentive Plan had been approved. The periods during which awards could be granted under the 1965 Stock Option Plan and 1959 Incentive Plan expired in April, 1970, and April, 1964, respectively.

Under the 1965 Stock Option Plan, awards could be granted to employees in the form of either (a) options to purchase common stock, or (b) dividend equivalents with an accompanying option to purchase an equal number of shares of common stock of the Corporation. Options expire at the end of five years unless terminated earlier in accordance with the terms of the Plan. Options may be exercised by payment in cash, or when exercised during employment by signing a purchase contract payable within five years. Shares sold under a purchase contract are held by the Corporation as collateral and are released as payments therefor are completed, subject to the provisions of Regulation G of the Federal Reserve Board. Option prices were 100 per cent of the fair market value per share on the date of the grant.

A "dividend equivalent" means the right to receive payments equivalent in value to dividends paid in cash on one share of common stock of the Corporation. Dividend equivalents were awarded for life unless forfeited under the terms of the Plan or terminated by exercise of the accompanying options.

The 1959 Union Carbide Incentive Plan provided for awards similar to those under the 1965 Stock Option Plan, except that options granted were for a period of ten years and the option prices were 95 per cent of the fair market value per share on the date of grant.

At December 31, 1971, there were 1,064,826 shares of common stock available for issuance under outstanding options. During 1972, 203,561 options were canceled or expired and 67,520 options were exercised. At December 31, 1972, options outstanding, held by 490 participants, covered 793,745 shares and the dividend equivalents outstanding (170,300 with accompanying options) totaled 1,093,840.

Report of Independent Certified Public Accountants

To Directors and Stockholders of
Union Carbide Corporation:

We have examined the balance sheet of Union Carbide Corporation and its subsidiaries consolidated as of December 31, 1972, and the related consolidated statements of income and retained earnings and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the statements identified above present fairly the financial position of Union Carbide Corporation and its subsidiaries consolidated at December 31, 1972, and the consolidated results of their operations and changes in their financial position for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

140 Broadway
New York, N.Y.
February 16, 1973

Haskins & Sells, Peney & Co

Certified Public Accountants

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BOC EX 187-T

Ten-Year Summary
Union Carbide Corporation and Consolidated Subsidiaries

(Dollars in Millions and Shares in Thousands—Except Per Share Figures)

	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963
Net Sales	$3,261	$3,038	$3,026	$2,933	$2,686	$2,546	$2,587	$2,339	$2,097	$1,841
Sales by Lines of Business										
Chemicals and Plastics	1,358	1,221	1,211	1,177	1,095	1,035	1,082	1,012	923	799
Gases and Related Products, Metals and Carbons, and Materials Systems	1,170	1,121	1,156	1,134	1,035	1,015	1,038	907	803	713
Consumer and Related Products	733	696	659	622	556	496	467	420	371	329
Net Income*										
Amount	205.2	157.8	157.3	186.2	157.0	170.7	239.6	239.1	200.1	153.2
Per Share	3.38	2.61	2.60	3.08	2.60	2.82	3.97	3.96	3.32	2.54
Dividends Paid										
Amount	121.3	121.1	121.0	121.0	120.9	120.9	120.8	120.7	108.4	108.4
Per Share	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.80	1.80
% of Net Income	59.1%	76.7%	76.9%	65.0%	77.0%	70.8%	50.4%	50.5%	56.0%	70.7%
Shares Outstanding (at Dec. 31)	60,732	60,568	60,479	60,479	60,465	60,454	60,423	60,388	60,234	60,220
Total Assets	$3,718	$3,555	$3,564	$3,356	$3,209	$3,088	$2,760	$2,566	$2,280	$2,035
UCC Stockholders' Equity										
Amount	1,934	1,844	1,805	1,767	1,701	1,665	1,608	1,480	1,348	1,225
Per Share	31.84	30.45	29.84	29.22	28.14	27.54	26.61	24.51	22.38	20.34
Construction Expenditures	243.9	335.2	393.7	322.2	347.1	478.7	393.6	282.6	293.4	181.9
Depreciation and Depletion	245.2	229.3	236.4	250.0	230.8	230.8	206.9	195.5	174.7	168.9
Employees at Year-End (excludes those at government-owned facilities)	98,114	99,161	102,144	104,411	100,448	99,794	101,785	92,259	90,404	85,047

*Net income for the year 1972 includes a charge from extraordinary items—net of tax of $2.2 million ($0.04 per share); and for 1971 and 1964 includes income from extraordinary items—net of tax of $4.8 million ($0.08 per share) and $6.6 million ($0.11 per share), respectively.

Net income per share based on average number of shares outstanding during the year; UCC stockholders' equity based on number of shares outstanding at Dec. 31 and shares outstanding and per share data adjusted for two-for-one stock split in 1965.

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Union Carbide Corporation/Operating Units

Executive Vice-President: **W. M. Anderson**

Chemicals and Plastics

R. D. Bower, R. J. Hughes, R. S. Wishart, Jr., *Group Managers*

Union Carbide produces and markets over 800 different chemicals and numerous formulations of basic plastics used in a wide variety of industries. Among the products are chemicals for making adhesives and sealants, agricultural and biochemical products, cosmetics, detergents, foams (such as urethane), fumigants, paints and other coatings, petroleum products, pharmaceuticals, and textiles. Major chemical products are ethylene oxide and its derivatives, coatings solvents, SEVIN and TEMIK insecticides, UCON refrigerants and propellants, and silicone surfactants. The plastics produced by this group include epoxy, parylene, phenolic, polystyrene, polysulfone, and vinyl resins.

Automotive and Home Products, Films—Packaging, and Polyethylene

E. E. Tarika, *Vice-President, UCC*

Automotive products include specially formulated coolants marketed under the well-known PRESTONE trade mark, as well as under custom brands, to protect the cooling systems of automobiles against freeze-ups in winter and overheating in summer. In the PRESTONE car care line are also polishes, brake fluids, engine tune-up chemicals, and ice fighters. Among the home products are the popular GLAD line of plastic bags, wrap, and drinking straws; the ALPHA brand of large disposer bags, sold primarily through hardware and drug outlets; and "6-12 Plus" insect repellent. A line of jewelry products is also marketed, including LINDE stars and LINDE simulated diamonds.

The Films—Packaging Division produces and markets cellulose and plastic films and sheeting. Three of the Division's major products are cellulose casings used to form skinless frankfurters, polyethylene film, and vinyl film and sheeting.

Many different forms of polyethylene and ethylene copolymer resins are produced offering a wide variety of fabricating and end-product properties. Principal uses for these resins are in making films for countless packaging applications; molded and extruded products such as housewares and toys; wire and cable jacketing and insulation; coatings for paper, paperboard, and foil; and adhesives for paper and nonwoven fabrics.

Union Carbide Europe, Inc.

J. C. Malone, *Chairman, and Vice-President, UCC*

A. A. Boehm, *Vice-Chairman*

This subsidiary represents the Corporation's interests in the United Kingdom and Continental Europe. Major producing companies in this area are:

MAJORITY OWNED

BELGIUM	Union Carbide Belgium
FRANCE	La Littorale S.A.
	Union Carbide France S.A.
GERMANY (W. ST)	Union Carbide Deutschland G.m.b.H.
GREECE	Union Carbide Hellas Industrial and Commercial S.A.
ITALY	Union Carbide Italia S.p.A.
	Elettrografite Meridionale S.p.A.
NORWAY	A/S Meraker Smeltverk
	A/S Saudefaldene
	Electric Furnace Products Company, Limited
SPAIN	Union Carbide Iberica, S.A.
	Union Carbide Navarra, S.A.
SWEDEN	Union Carbide Norden AB
UNITED KINGDOM	British Acheson Electrodes Limited
	Union Carbide U.K. Limited

50 PER CENT OWNED

BELGIUM	Evipak S.A.
FRANCE	Tamimo S.A.
	Viscora, S.A.
SPAIN	Argon, S.A.
SWEDEN	Unifos Kemi AB
UNITED KINGDOM	Bakelite Xylonite Limited
	Viskase Limited

Executive Vice-President: **D. H. Freeman**

Battery Products Division

J. M. Rehfield, *President*

More than 1,000 different types of batteries are marketed by this Division under the EVEREADY and HERCULES trade marks, as well as under custom brands. These batteries are used in flashlights, radios, television sets, tape recorders, phonographs, hearing aids, photographic equipment, toys, and a variety of cordless appliances. Other EVEREADY products include flashlight cases, lamps, and lanterns.

Union Carbide Eastern, Inc.

B. T. Burgoyne, *Chairman, and Vice-President, UCC*

This subsidiary has responsibility for interests in Oceania and Asia. Major producing companies are:

MAJORITY OWNED

AUSTRALIA	Union Carbide Australia Limited
HONG KONG	Sonca Industries Limited
INDIA	Union Carbide India Limited
INDONESIA	P. T. Union Carbide Indonesia
JAPAN	Union Carbide Services Eastern Limited
MALAYSIA	Union Carbide Malaysia Sdn. Bhd.
NEW ZEALAND	Union Carbide New Zealand Limited
PAKISTAN	Union Carbide Pakistan Limited
PHILIPPINES	Union Carbide Philippines, Inc.
REPUBLIC OF SRI LANKA	Union Carbide Ceylon Limited
SINGAPORE	Metals and Ores Pte. Limited
	Union Carbide Singapore Pte. Limited
THAILAND	Union Carbide Thailand Limited

50 PER CENT OWNED

JAPAN	Nippon Unicar Company Limited
	Shin Nippon Carbon Company, Ltd.
	Showa Union Gosei Co., Ltd.
	Showa Unox K.K.
	Union Showa K.K.
THAILAND	Thailand Exploration and Mining Company Limited
	Thailand Smelting and Refining Company Limited

Union Carbide Pan America, Inc.

J. H. Jones, *Chairman*

The Corporation's interests in Latin America are represented by this subsidiary. Major producing companies are:

	MAJORITY OWNED
ARGENTINA	Union Carbide Argentina S.A.I.C.S.
BRAZIL	S.A. White Martins
	S.A. White Martins Nordeste
	Union Carbide do Brasil S.A.I.C.
COLOMBIA	Union Carbide Colombia, S.A.
COSTA RICA	Union Carbide Centro Americana, S.A.
ECUADOR	Union Carbide Ecuador C.A.
MEXICO	Union Carbide Mexicana, S.A.
VENEZUELA	Union Carbide de Venezuela, C.A.

Executive Vice-President: **F. B. O'Mara**

Carbon Products Division

F. B. Vernon, *President*

This Division produces carbon and graphite (highly refined carbon) in thousands of shapes and forms. Electrodes for furnaces used in making steel, iron, alloys, abrasives, and phosphorus are its most important product line. Arc carbons are produced for motion-picture projection and studio lighting, solar simulation, and spectroscopic analysis. Special products are made for aerospace, chemical, electrical, mechanical, metallurgical, and nuclear use. High-temperature refractory materials are also produced.

Ferroalloys Division

F. C. Kroft, Jr., *President*

This Division is a major supplier of chromium, manganese, and silicon alloys. The alloys are basic ingredients used in making all types of ferrous metals—including the large-tonnage carbon steels, stainless steels, special alloy steels, and cast irons—as well as such nonferrous metals as aluminum. The Division also mines coal for internal consumption. In addition, it is a major supplier of calcium carbide used in metallurgical and chemical applications.

Linde Division

J. G. Benson, *President*

A major activity of this Division is the production of purified gases—primarily oxygen, nitrogen, argon, hydrogen, helium, and acetylene. They are used in the production and fabrication of steel and other metals, in the aerospace program, in chemical and petroleum processing operations, and in wastewater treatment. The Division manufactures equipment used in various industrial processes, such as cryogenic equipment for production and storage of gases, for welding and flame-cutting, and for POLARSTREAM liquid nitrogen refrigeration for in-transit preservation of food. It also markets proprietary processes for the refinement of stainless steel (argon-oxygen decarburization) and for the purification of industrial and municipal wastewaters (UNOX system). In addition, it produces and markets molecular sieves, highly efficient adsorbents and catalysts used by the petroleum, natural gas, and chemical industries.

Mining and Metals Division

J. C. Stephenson, *President*

This Division has responsibility for worldwide minerals exploration; domestic mining and processing of tungsten, vanadium, and uranium ores; and production of certain specialty metals and alloys. For example, it supplies combinations of aluminum and such metals as chromium, manganese and iron to the aluminum industry; vanadium for high-strength steels used in structural applications and line pipe; uranium concentrates for nuclear energy operations; and high-purity asbestos for tile, paper, plastics, and rubber.

Union Carbide Canada Limited

J. S. Dewar, *President*

This subsidiary, which is 25 per cent owned by the Canadian public, carries on widely diversified activities in the fields of chemicals, plastics, gases, metals, carbons, fibers, and consumer products. It has approximately 5,000 employees and has 42 plants, 8 laboratories, and 30 sales offices throughout Canada.

Union Carbide Africa and Middle East, Inc.

F. B. O'Mara, *Chairman* **D. N. Wait, *Vice-Chairman***

The Corporation's interests in Africa and the Middle East are represented by this subsidiary. Major producing companies include:

	MAJORITY OWNED
GHANA	The African Manganese Company Limited
	Ucar Plastics (Ghana) Limited
	Union Carbide Ghana Limited
IRAN	Union Carbide Iran S.A.
IVORY COAST	Union Carbide Cote d'Ivoire
KENYA	Union Carbide Kenya Limited
REPUBLIC OF SOUTH AFRICA	Chrome Corporation (South Africa) (Proprietary) Limited
	Ruighoek Chrome Mines (Proprietary) Limited
	Ucar Chrome Company (S.A.) (Proprietary) Limited
	Ucar Minerals Corporation
RHODESIA	The African Chrome Mines Limited
	Rhodesia Chrome Mines Limited
	Union Carbide Rhomet (Private) Limited
	50 PER CENT OWNED
REPUBLIC OF SOUTH AFRICA	Elektrode Maatskappy Van Suid Afrika (Eiendoms) Beperk

Corporate Technology and New Business Development

T. R. Miller, *Vice-President, UCC*

This group has responsibility for pursuing new business directions for the Corporation, including both new products and new markets that fall outside the areas of responsibility of the major operating units. It follows research projects through their developmental phase on through early commercial operation. Projects recently nurtured by this group include the CENTRIFICHEM high-speed analyzer, seed tape, and plastic paper.

Atomic Energy Operations

J. A. Swartout, *Vice-President, UCC*

Nuclear Division

R. F. Hibbs, *President*

Through the Nuclear Division, Union Carbide operates government-owned nuclear energy facilities at Oak Ridge, Tennessee, and Paducah, Kentucky. These facilities include gaseous diffusion plants for separating uranium isotopes; special production and research units that fabricate components for defense use; and Oak Ridge National Laboratory—one of the world's largest nuclear research centers.

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Union Carbide's Directors and Officers

DIRECTORS

R. Manning Brown, Jr
Chairman, New York Life Insurance Company

Roberto de Jesus Toro
President, Banco de Ponce (Puerto Rico)

John W. Drye, Jr
General Counsel, Union Carbide; Partner Kelley Drye Warren Clark Carr & Ellis, Lawyers

J. Victor Herd
Director, The Continental Corporation and The Continental Insurance Companies

James M. Hester
President, New York University

Jerome H. Holland
Director of Various Corporations

James R. Johnstone
Vice-Chairman

Allen T. Lambert
Chairman and President, The Toronto-Dominion Bank

George H. Love
Honorary Chairman, Consolidation Coal Company

Birny Mason, Jr.
Chairman of the Executive Committee

Robert E. McNeill, Jr.
Former Chairman, Manufacturers Hanover Corporation

William B. Nicholson
Vice-Chairman

William S. Sneath
President and Chief Operating Officer

J. Harris Ward
Chairman, Commonwealth Edison Company

F. Perry Wilson
Chairman of the Board and Chief Executive Officer

MANAGEMENT COMMITTEE

F. Perry Wilson, *Chairman*
William S. Sneath
James R. Johnstone
William B. Nicholson

EXECUTIVE COMMITTEE

Birny Mason, Jr., *Chairman*
John W. Drye, Jr.
J. Victor Herd
William S. Sneath
F. Perry Wilson

AUDIT COMMITTEE

J. Harris Ward, *Chairman*
J. Victor Herd
Allen T. Lambert

COMPENSATION COMMITTEE

George H. Love, *Chairman*
R. Manning Brown, Jr.
Birny Mason, Jr.
Robert E. McNeill, Jr.

PUBLIC POLICY COMMITTEE

James M. Hester, *Chairman*
Roberto de Jesus Toro
John W. Drye, Jr.
Jerome H. Holland
William S. Sneath

OFFICERS

F. Perry Wilson, *Chairman of the Board and Chief Executive Officer*

William S. Sneath
President and Chief Operating Officer

James R. Johnstone, *Vice-Chairman*

William B. Nicholson, *Vice-Chairman*

Warren M. Anderson
Executive Vice-President

Douglas H. Freeman
Executive Vice-President

Fred B. O'Mara
Executive Vice-President

Buhl T. Burgoyne, *Vice-President*

Robert F. Flood, *Vice-President*

Carl H. Hageman, *Vice-President*

Frank R. Lyon, Jr., *Vice-President*

James C. Malone, *Vice-President*

Thomas F. Miller, *Vice-President*

William E. Pardoe
Vice-President and Chief Financial Officer

John F. Shanklin
Vice-President and Secretary

John A. Swartout, *Vice-President*

Elio E. Tarika, *Vice-President*

George C. Wells, *Vice-President*

Stephen E. Nightingale, *Treasurer*

John A. Willis, *Controller*

Morse G. Dial, Jr.
Regional Vice-President (Washington)

Norman J. Hearn
Regional Vice-President (Far West)

Fred L. Shanklin
Regional Vice-President (Midwest)

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UNION CARBIDE CORPORATION
270 PARK AVENUE, NEW YORK, N.Y. 10017

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THE BANK OF NEW YORK

[illegible] Equity Fund Inc. 058760 2

THE DISCOVERY COMPANY

General Offices—Union Carbide Building, 270 Park Avenue, New York, N.Y. 10017.

Stock Transfer Agents—Union Carbide Corporation, Saw Mill River Road, Route 100 C, Tarrytown, N.Y. 10591 (New York City stock deliveries c/o Manufacturers Hanover Trust Company, 4 New York Plaza, New York, N.Y. 10004).

Registrars—Manufacturers Hanover Trust Company, 4 New York Plaza, New York, N.Y. 10004.

Stock Exchange Listings—United States: New York, Midwest, and Pacific Coast. Overseas: Amsterdam, Basle, Brussels, Paris, and Zurich.

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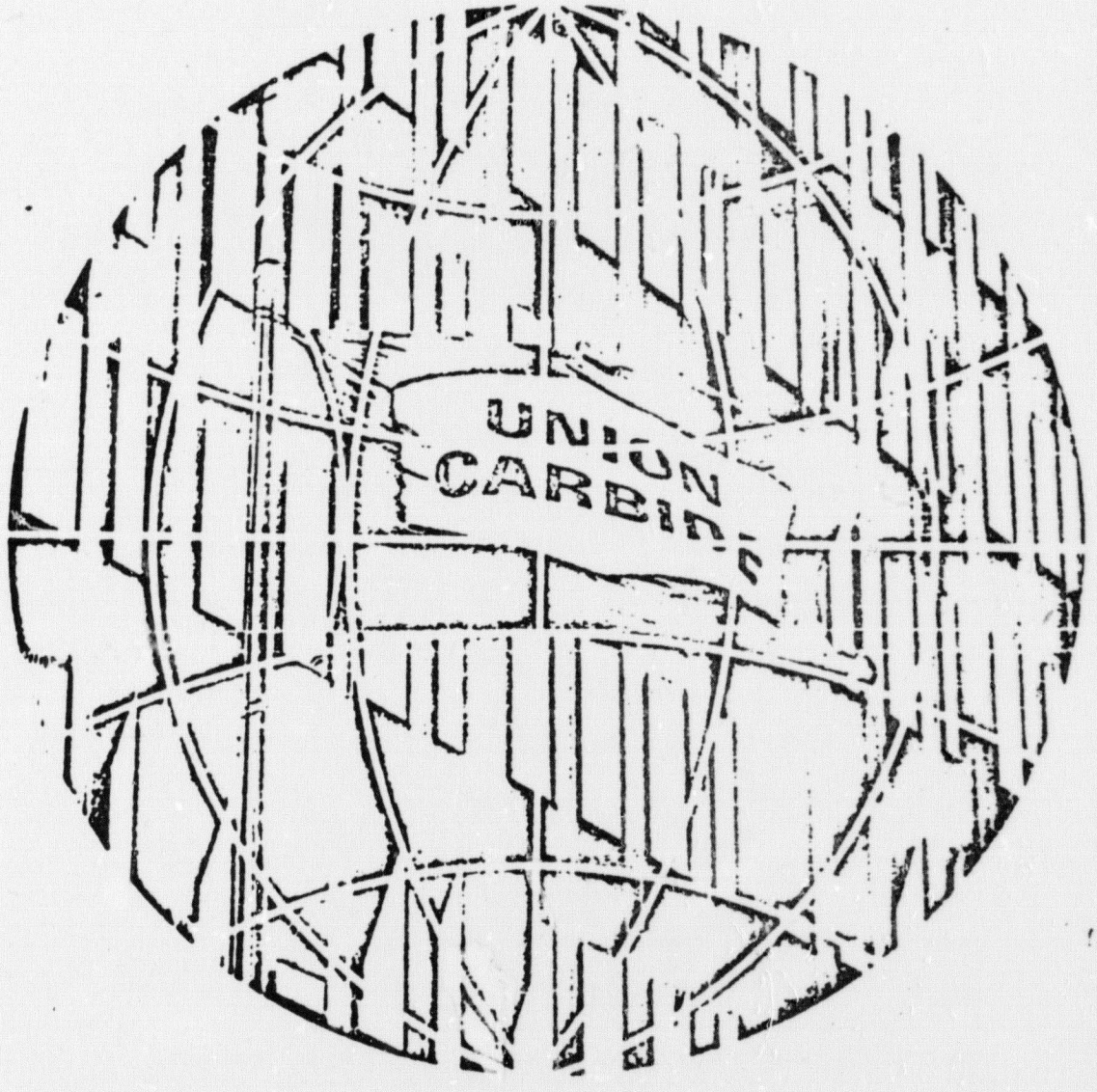

UNION CARBIDE CORPORATION ANNUAL REPORT 1973

Union Carbide 1973

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Union Carbide Corporation
Annual Report 1973

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Financial Summary
(Dollars and Shares in Millions—Except Per Share Figures)

	1973	1972
Sales	$3,938.8	$3,261.3
Net Income	$ 290.9	$ 205.2
Per Share*	$ 4.78	$ 3.38
Dividends	$ 126.1	$ 121.3
Per Share	$ 2.075	$ 2.00
% of Net Income	43.4%	59.1%
Net Income Retained	$ 164.8	$ 83.9
Total Assets	$4,162.4	$3,718.3
UCC Stockholders' Equity	$2,104.2	$1,933.6
Per Share**	$ 34.57	$ 31.84
Number of Stockholders	189,300	188,000
Shares Outstanding at Dec. 31	60.9	60.7
Construction	$ 288.7	$ 243.9
Depreciation	$ 245.2	$ 245.2
Research and Development	$ 76.8	$ 69.6

*Based on weighted average number of shares outstanding during the year.
**Based on number of shares outstanding at Dec. 31.

To Our Stockholders:

The year 1973 was an all-time record one for Union Carbide. Sales increased by 21 per cent over 1972 to $3.94 billion, and earnings by 42 per cent to $4.78 per share, after a net nonrecurring charge of $0.22 per share.

All major product lines were in great demand throughout the year, with special strength in products sold to industry. Impetus was given to business growth not only by the robust economy in the United States—where our sales increased by 14 per cent, but also by buoyant demand abroad—where the increase was 35 per cent.

During recent years, we have eliminated a number of unsuitable operations and shut down obsolete or marginally profitable plants. As a result, operations were at a high level of efficiency in 1973, and plant performance was generally outstanding. There were two exceptions. In Brazil, the troublesome Wulff process olefins unit at the Cubatao plant, which we have mentioned before, was closed down. This resulted in a nonrecurring write-off amounting to 38 cents per share. The remainder of the plant is continuing to produce polyethylene—its principal product—at near capacity, using purchased ethylene. Financial performance will improve as a result of the olefins unit shutdown. In Puerto Rico, operations at the Ponce petrochemicals plant were hampered because of an island-wide shortage of electric power. This problem has since been corrected.

Although there was some shortage of basic hydrocarbon feedstocks during 1973, this did not become a serious problem until late in the year. Nevertheless, we were unable to meet demands of our customers for a number of important products, principally because of the unexpected strength in demand and our lack of sufficient plant capacity. Inventories were reduced—in some instances to unsustainably low levels—in an effort to keep customers supplied.

As this is written, great concern is being expressed on all sides about the Energy Crisis and the effects this will have on our personal lives and on business. Certainly, the United States and much of the rest of the world will have to make important adjustments. We have great confidence in the ingenuity of business and of the public at large to learn rather quickly how to cope with this changed situation. We believe that learning to live with less waste of energy will in the long run be a good thing for America. We are pleased to see the recognition by the Government in its feedstock allocation program of the critical importance of the chemical industry as a supplier to a myriad of downstream industries. Finally, we see many new opportunities for a technically preeminent company such as Union Carbide to develop new sources of energy and new processes and products that will utilize energy and energy-related materials more efficiently.

We were materially handicapped—unfairly, we believe—by Phase IV of the price control program in the United States. Because Union Carbide's profit margin has been in excess of its base-period margin (which was abnormally low), we were generally prevented from raising selling prices during the second half of 1973 in spite of rapidly increasing costs on all fronts—raw materials, wages, distri-

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bution, and equipment. Our domestic selling price index went up by only about one and one-half per cent in 1973, but remained almost 20 per cent below the 1960 level, whereas industrial prices generally had risen over 30 per cent since 1960. We are pleased with the action of the Cost of Living Council in late January 1974 granting exemption to most petrochemical feedstocks and partial relief to a large group of petrochemical products. This action will have a beneficial effect on our petrochemical business, and we consider it a positive step toward ultimate decontrol and return to a free market system. The marketplace is more than ready to support the higher selling prices needed to maintain profit margins in the face of the significantly higher costs we will experience with still greater impact in 1974. Such higher prices are essential if continuing increases in plant capacity are to be justified.

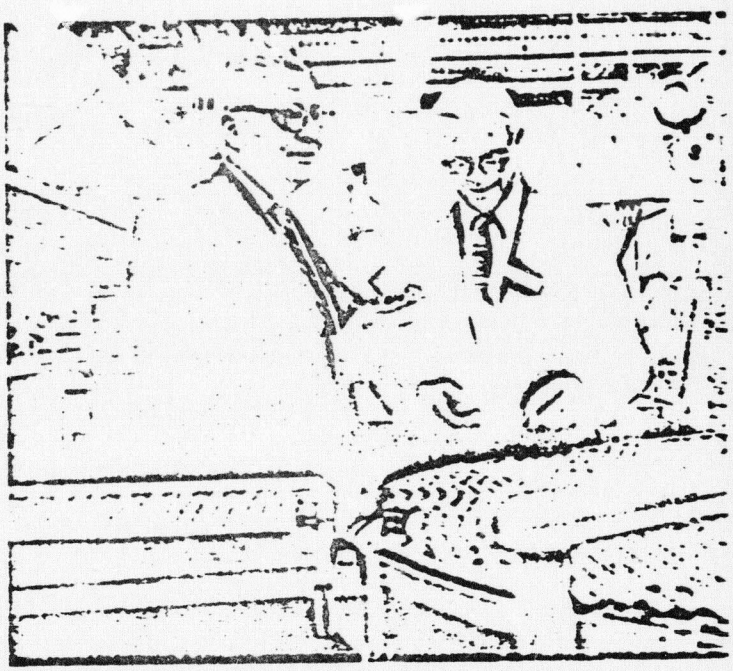
A year ago we mentioned that a formal Union Carbide Management System had been adopted. During 1973, this was extended throughout our worldwide organization and to successively lower levels of management. We feel the adoption of this system has been an important contributor to our progress in 1973 and will continue to be in future years. We believe the Corporation is being run with an enhanced sense of purpose, with improved awareness of objectives, and with a new spirit of understanding at all levels of management. An Incentive Program to assist in implementing the Management System by providing rewards based on performance in meeting established goals is being proposed for stockholder approval. Details of this are set forth in the Proxy Statement about to be mailed to you.

We would like to express our appreciation to George H. Love and John W. Drye, Jr., who retired as Directors of the Corporation in 1973. Mr. Love had served on the Board since 1952, and Mr. Drye had been a Director and General Counsel since 1953. The sage counsel of both will be missed.

In April, Frank R. Lyon, Jr., a Vice-President of the Corporation and former Director of the Law Department, was appointed General Counsel and elected a Director of Union Carbide. In September, James L. Ferguson, President and Chief Executive Officer of General Foods Corporation, became a member of the Board.

At its April meeting, the Board of Directors increased the quarterly dividend from 50 to 52½ cents per share. The new committees of the Board established in 1972 were all active during the year. The Audit Committee examined accounting policies and the adequacy of both internal and external audits and controls with our auditors, Hurdman and Cranstoun, both with and without representatives of management in attendance. The Public Policy Committee reviewed the status and activities of the Corporation with respect to environmental affairs, equal employment opportunities, health and safety, charitable contributions, and aid to education. In addition to considering compensation levels and practices for officers and key employees, the Compensation Committee played an active role in the development of the proposed Incentive Program.

Your management extends its sincere thanks to all employees, directors, and stockholders for their loyal and dedicated support during the past year.



Chairman F. Perry Wilson (left) and President William S. Sneath stop to examine EVEREADY alkaline batteries during tour of Asheboro, North Carolina, plant following a Board of Directors meeting there in October. The Asheboro facility is the largest and one of the most modern of Union Carbide's 47 plants throughout the world producing batteries and related products.

The Annual Meeting of Stockholders will be held on April 24 at 11:00 A.M. in our headquarters building at 270 Park Avenue in New York, and you are cordially invited to be with us.

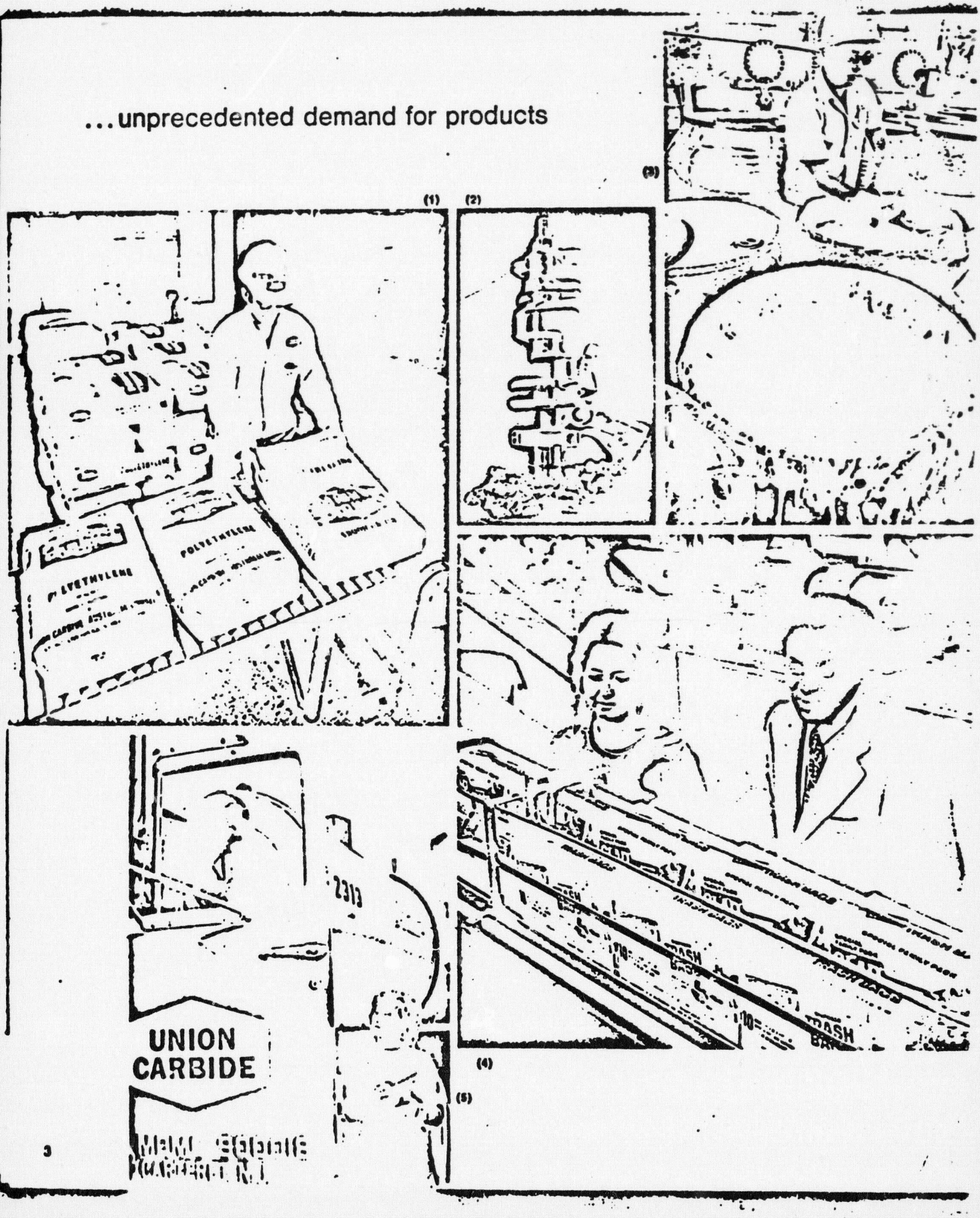
Respectfully submitted,

F. P. Wilson
Chairman of the Board

W. S. Sneath
President

March 12, 1974

...unprecedented demand for products



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The Year 1973 at Union Carbide in Review

Sales in 1973 rose to a record $3.94 billion, for a gain over 1972 of approximately 21 per cent. Earnings also were the best in Union Carbide's history, increasing 42 per cent to a new peak of $291 million, or $4.78 a share.

Whereas early in 1973 some slowdown later in the year had been expected, sales continued strong throughout the entire year, both in the United States and around the world. Despite escalating costs and limitations on selling prices under the Government's price control program, the Corporation was able to achieve record earnings as the result of high sales volume and good operating performance.

Strong U.S. Economy Spurs 1973 Sales to Record Highs

In the United States, sales increased 14 per cent over 1972. The greatest strength was in industrial products—chemicals, plastics, gases, metals, and carbons. However, consumer and related products also showed very satisfactory sales gains.

Exports from the United States—direct to customers and to subsidiaries—declined about 5 per cent in physical volume. The dollar value of these exports increased over 1972 by about 30 per cent, but this was primarily due to a shift in mix toward higher-value products, rather than to higher unit selling prices. Union Carbide thus contributed favorably once again to this country's balance of payments. Its contributions have totaled almost one billion dollars during the past five years.

It was a record year for chemicals and plastics, with sales in all markets well above the previous year's level. Because of capacity limitations, there were restrictions in sales of many products, including ethylene oxide, acetic acid, phenol, and their derivatives; polyethylene; vinyl resins and plasticizers; styrene; and polystyrene.

The high level of automobile production and growing acceptance of Union Carbide's system for making foam seating resulted in outstanding growth of the urethane intermediates business. Healthy housing and electronics markets were important factors in increased sales of coating resins and solvents and silicone chemicals. Business activity in most plastic product lines was at a very high level throughout the year, and both low- and high-density polyethylene are expected to continue in short supply for several years until new capacity is brought on-stream.

Agricultural chemical sales showed a sharp increase. Two important proprietary products, Union Carbide's well-established SEVIN insecticide and its recently introduced TEMIK pesticide, are in strong demand worldwide, both in developed and developing countries.

With the steel industry having its biggest year ever, Union Carbide's gases, metals and carbons business had good sales gains and operated substantially at capacity.

Industrial gas sales benefited both from increased industrial output and from new applications in the metallurgical, food, wastewater treatment, plastics, chemical, and rubber industries. Markets for all gases expanded, including the use of liquid nitrogen in food freezing, and argon for Union Carbide's proprietary argon-oxygen decarburization process, which is now being used for refining about 50 per cent of the stainless steel produced in the Free World.

Capacity operations in the domestic ferroalloys industry and a high level of imports were required to satisfy the needs of the U.S. steel business in 1973. Union Carbide's ferroalloy plants ran at peak levels, limited only by some power shortages in the Pacific Northwest and planned shutdowns of some furnaces for installation of pollution-abatement equipment.

It was a year of high demand for both vanadium and tungsten, resulting in record sales for these specialty metals. Worldwide exploration for metals of interest to Union Carbide was stepped up.

Sales of carbon and graphite products were up substantially over 1972, aided by gains in electric furnace steelmaking. An important increase in graphite electrode production will be available in 1974 with the completion of pollution-control facilities at two carbon plants, construction of which

(1) At the Altona plant of Union Carbide's Australian affiliate, Danny Schembri stacks bags of high-density polyethylene ready for shipment. Major uses for the plastic include blow-molded bottles, injection-molded crates, and extruded pipes. (2) This automobile crankshaft is made of ductile iron, a growing market for Union Carbide's ferrosilicon. (3) Dramatic growth of the latex business continued in 1973, supported by new capacity at regional plants. Here, Od Rodraksasab fills drums at the new plant near Bangkok in Thailand. (4) Marcus Clarke, plant manager at Wayne, New Jersey, stops to talk with Barbara Potter, a carton loader on the GLAD products line. (5) As part of her orientation program, Sales Trainee Janice Lush prepares to ride a tank truck making delivery of chemicals.

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required taking capacity off the line during 1973.

In the consumer products area, limited supplies of ethylene glycol held production of PRESTONE II anti-freeze and coolant below that of 1972. High inventories at the begining of the year softened the impact at the retail level, but did not prevent some local shortages from developing toward the end of the year. The GLAD products business—bags, wrap, and straws—had another record year, with the increasing consumer use of trash bags being the major contributor to sales growth.

Major worldwide expansion of the battery business continued. Record U.S. sales were again paced by gains in rechargeable nickel-cadmium batteries and miniature and standard-size alkaline batteries. Excellent future growth is seen for these product lines for such end uses as lawn and power tools, minicalculators, electric watches, and pocket cameras. EVEREADY lighting product sales were spearheaded by unique packaging and products, such as the new SKIPPER flashlight, which floats.

Growth in International Areas Outpaces Domestic Gains

Outside the United States, even greater growth was achieved. Sales of consolidated international subsidiaries increased 35 per cent over the previous year.

Markedly improved results in all major product areas characterized operations in Canada, where both sales and earnings reached record levels. Significant developments included the start-up at Beauharnois, Quebec, of the largest furnace in the Western World for the production of ferromanganese and silicomanganese. Also, work was begun on a major expansion of ethylene derivatives capacity at the Montreal East, Quebec, plant.

Subsidiaries in Latin America also had an outstanding year, with sales growing more than 30 per cent. In Brazil, the industrial gas business did exceptionally well, and sales in Mexico were strong in all product lines. It was decided to terminate operation of the vinyl chloride monomer, acetylene black, and Wulff process olefins sections of the Brazilian subsidiary's Cubatao plant. Polyethylene facilities on the site are continuing to operate at near-capacity levels, using purchased ethylene, and these will be upgraded to meet the growing demand of the Brazilian market for more sophisticated products.

Sales in the European area increased approximately 50 per cent over the previous year. Sales of Bakelite Xylonite Limited, a company manufacturing plastics in the United Kingdom, were included in Union Carbide's second-half 1973 sales figures, as this company became a wholly owned subsidiary on July 1, 1973. Prior to that time, the Corporation owned only 50 per cent of the stock of Bakelite Xylonite Limited and consequently its sales were not consolidated. Had they been consolidated throughout both 1972 and 1973, the European sales increase in 1973 would be 25 per cent. Certain parts of that subsidiary's business were sold in September in a move to concentrate efforts in the United Kingdom in business areas of particular strength, such as low-density polyethylene, film products, thermosetting resins, and decorative and industrial laminates.

All product lines benefited from strong European economies. The principal contributors to higher sales were greater physical volume and higher selling prices. Also, changes in currency values favorably affected sales gains, and sales to Eastern Bloc countries increased substantially. During the fourth quarter, several affiliates were forced to reduce petrochemicals production because of the lowered availability of petroleum-based raw materials resulting from restriction of crude oil shipments from the Middle East. However, increases in market prices offset the loss in volume, and profit levels were maintained.

Conditions were buoyant throughout the Far East area except in India, where a lack of rainfall in 1972 disrupted the economy and affected consumer purchasing power through mid-1973. Moreover, the drought resulted in a shortage of the electrical energy necessary to operate plants full time. Australian and New Zealand affiliates had a particularly good year. In Japan, with a more favorable economy, operations improved significantly over the previous year, even though some continued to show a loss.

Sales in Africa and the Middle East grew by 40 per cent. New electrode baking facilities have been brought on-stream in South Africa for processing Union Carbide's ultra-high-powered graphite electrodes for the local steel industry.

Plants Perform Well at Peak Capacity

Virtually all facilities operated at very high levels during the year until shortages of petroleum-based raw material limited production at year-end. Plant performance generally was excellent. However, as is discussed elsewhere, the output of the Ponce, Puerto Rico, chemicals plant was limited for several months by a shortage of purchased power caused by operating difficulties in supplier facilities. This problem was largely corrected, and operations there returned to near-capacity levels, although limited somewhat by raw material availability.

Good progress continued to be made in long-standing energy conservation programs. Efforts in this regard in the domestic chemicals and plastics business alone saved over $8 million in 1973.

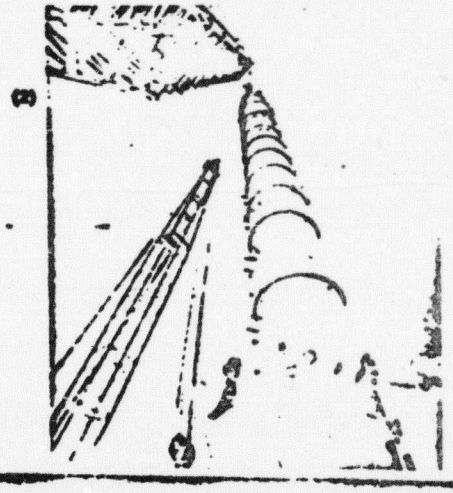
Major Expansions Planned

Building for future growth, Union Carbide has announced major expansion programs throughout the world. New investment is being concentrated in fields in which the Corporation has particular strengths. In the chemicals and plastics area, expansion programs include new facilities for ethylene oxide and glycol both in the United States and Canada, acetic acid, vinyl acetate, silicones, polyols for urethane foam, plasticizer alcohols, polystyrene, and both high-density and low-density polyethylene.

To serve the growing electric furnace steel industry, domestic graphite electrode capacity will be increased by 20 per cent through expansion of the plants at Yabucoa, Puerto Rico, and Columbia, Tennessee. To

...the need for more feedstocks and capacity

(1)



(1) A tanker delivers naphtha—critical feedstock for chemicals production—to the Taft, Louisiana, plant. Unloading the entire cargo usually takes from 24 to 36 hours. (2) A crane is ready to lift a tall fractionating tower into place—a familiar scene at chemicals plant construction sites. In 1973, Union Carbide and its subsidiaries spent $289 million on new facilities to meet growing demands for products around the world.

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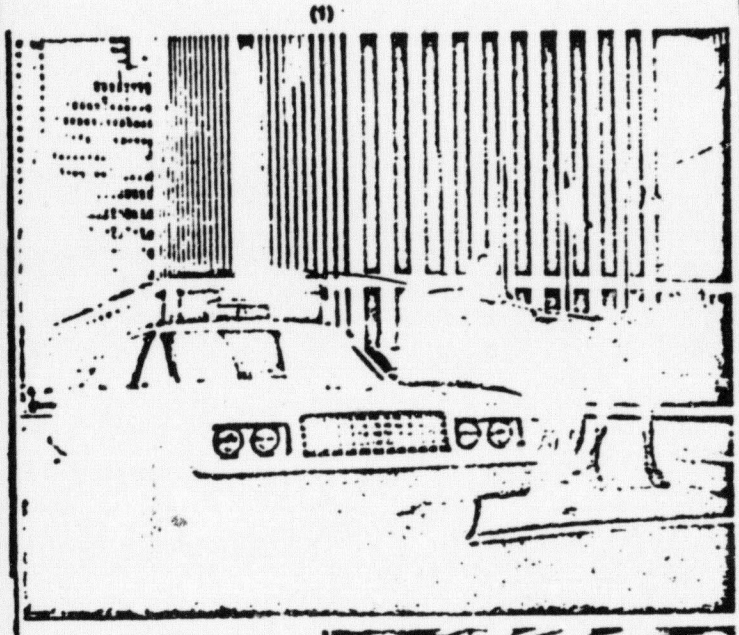
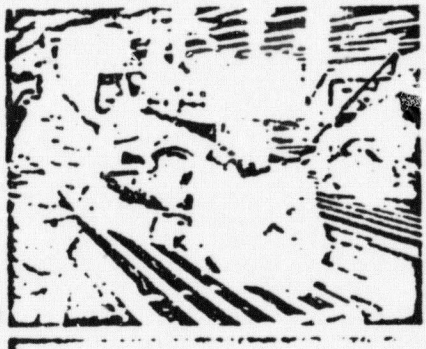
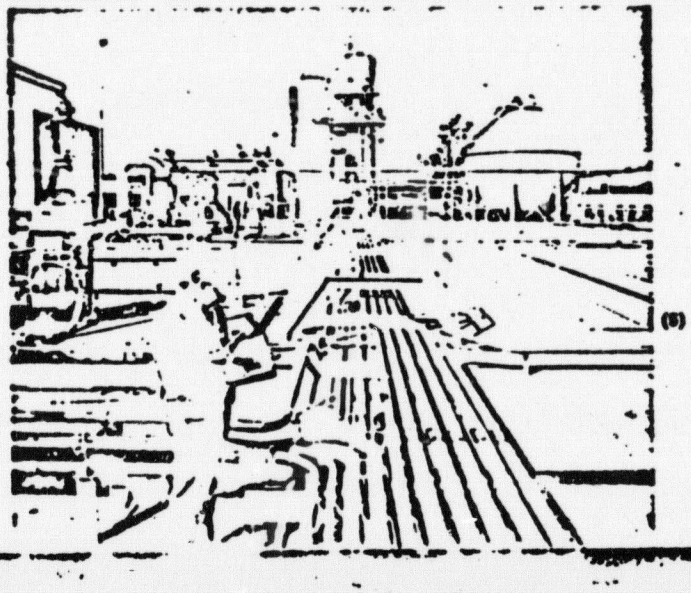
...providing for the good life







supply northern Europe—particularly France, Benelux, Western Germany, and Denmark—a $35 million graphite electrode plant is to be built at the French port city of Calais. Union Carbide announced in 1973 the seventh and eighth expansions, each adding 1,200 tons per day of capacity, at the extensive industrial gas complex serving the Chicago area—where demand for oxygen for steelmaking is growing rapidly. Similarly, the sixth major expansion of the molecular sieve (adsorbent and catalyst) plant in Alabama is under way, and a new facility is scheduled to start up on the southern coast of Italy in mid-1974.

The battery products business, continuing to grow at a very healthy rate, is being expanded in many areas. Building projects include a major addition to the newest domestic plant, in Missouri, and expansions of a number of overseas operations. Plans are being made for a new battery plant in the Sudan. Capacity of the world's largest flashlight case plant, operated by a Union Carbide affiliate in Hong Kong, is being doubled. This plant serves overseas markets. EVEREADY flashlight cases for the U.S. market continue to be competitively produced at the St. Albans, Vermont, facility.

(1) This taxi, pulled up beside a han.. om cab, is one of 100 that were on New York City streets in 1973 testing a unique soft-face bumper system. The flexible urethane elastomer front end reverts to its original shape following impact. (2) In the New York Mets' clubhouse, Willie Mays shows off his UNDE star ring, which he received as a member of the 1973 All-Star Baseball Team. The rings were also once again chosen to recognize all-star basketball and hockey players and, in addition, are part of the baseball and basketball Hall of Fame collections. (3) Bags of PERFLEX film are used at Stop and Shop's Marlboro, Massachusetts, meat plant to package and preserve large-block meat cuts for shipment to their retail stores. (4) This angler is casting with an experimental fishing rod made of THORNEL graphite fibers, which have already seen considerable use in golf clubs and are being tried in other new consumer products such as tennis rackets and skis. (5) The city of Detroit, with a population of 3 million, expects to save more than $6 million in capital costs and to reduce operating costs as well, using this UNOX wastewater treatment system.

Phase IV Price Controls Prevented Offsets for Escalating Costs

The effect of U.S. Government price restrictions on the profitability of its businesses was of great concern to Union Carbide. Petrochemical raw materials costs escalated rapidly during 1973, and compensatory price increases were not permitted. Ferroalloy price increases scheduled to become effective in mid-1973 had to be cancelled, yet raw material and labor costs were $10 million more than in 1972. The price of Union Carbide's tungsten was frozen at a level that, when prices of nonferrous metals were decontrolled in mid-December, was 20 per cent below the world market price. The battery products business experienced the largest increase in costs of raw materials in its history. At the end of January 1974, a limited relaxation of price controls was announced by the Cost of Living Council.

Steps Taken to Assure Raw Material Position

The question of how best to assure its hydrocarbon raw material supply has been receiving constant attention at Union Carbide. This effort is headed by a Feedstock and Energy Policy Council at the highest corporate level.

In 1973, the petrochemical feedstock problem was more one of costs than of availability. Union Carbide benefited from its diverse raw material and energy base, a unique pipeline collection system, and a multiplicity of supply agreements.

Looking to the future, Union Carbide's Canadian subsidiary is a participant in a major project in Sarnia, Ontario, scheduled to provide the company with over 300 million pounds per year of additional ethylene in Canada. An expected further major benefit from this project is a supply of feedstock for a coker, which would provide by 1977 a significant portion of Union Carbide's worldwide needs for petroleum coke, the raw material for its important graphite business.

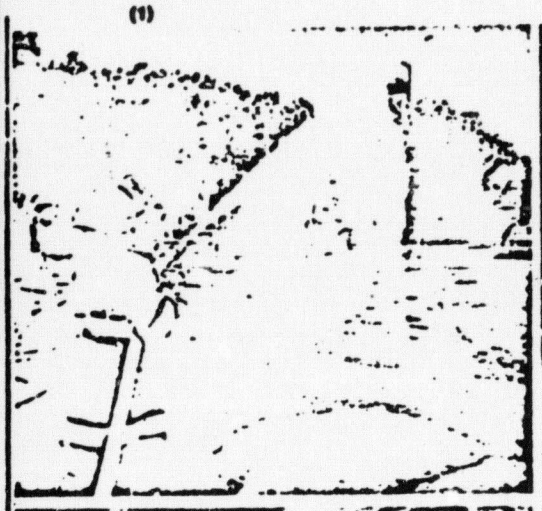
A number of other possibilities are under consideration that could involve foreign partnership aimed at providing assured feedstocks for the Corporation's petrochemical business, both at home and abroad. Work is in progress in collaboration with two Japanese firms involving new technology that would permit the manufacture of ethylene directly from crude oil and heavy fractions. A development further in the future is aimed at the conversion of synthesis gas derived from coal or hydrocarbon sources into some products now made from olefins.

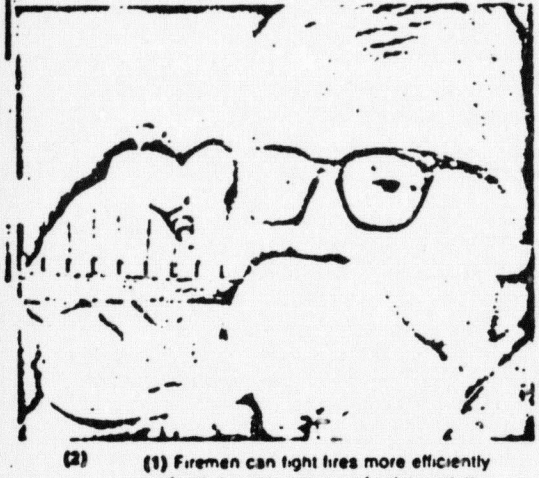
Developing Businesses Move Ahead

In the new business development area, Union Carbide has selected several "targeted arenas" for support. Two of them showed substantial sales gains in 1973. One is electronic materials and components,

...targets for future growth

(1)



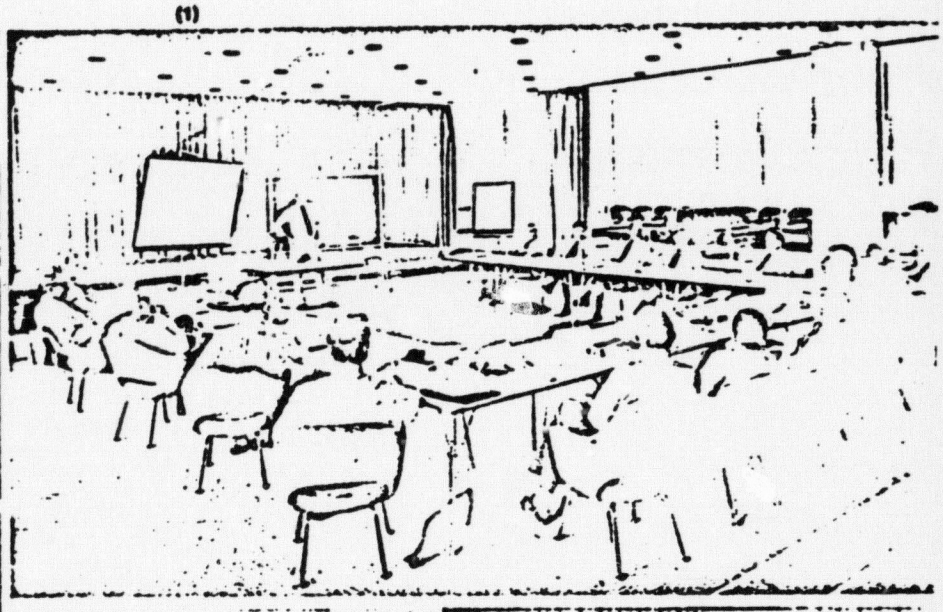


(2)

(1) Firemen can fight fires more efficiently and with a greater margin of safety with the help of UCAR Rapid Water additive developed by Union Carbide. It makes water flow faster through fire hoses and increases its reach by as much as 70 per cent. (2) Jan Marsh, a capacitor assembler at the Greenville, South Carolina, components plant, applies epoxy resin to a rack of tantalum capacitors. The epoxy-filled design is one of several different configurations used to achieve wide application of these versatile electronic components.

...strengthening the organization

(1)



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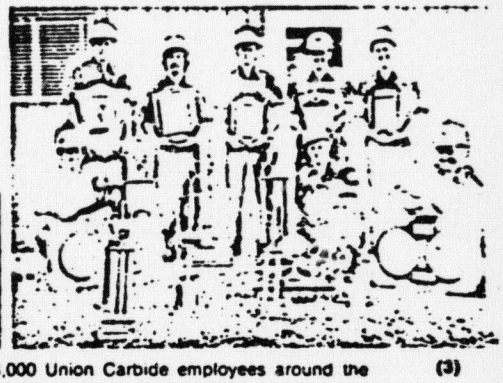

(3)

(1) At year-end, more than 4,000 Union Carbide employees around the world had participated in seminars (above) and workshops established as part of the new Management System program to assist key personnel in becoming better professional managers. (2) President William S. Sneath presents Union Carbide's "Distinguished Safety Performance Award" to Jack M. Case, Superintendent of the Y-12 nuclear plant at Oak Ridge, Tennessee. In 1973, plant employees there worked 13.7 million man-hours without a disabling injury—setting a new record. (3) Members of the Blue Creek, West Virginia, Mine Rescue Team pose with the impressive array of trophies and plaques they accumulated during competition in 1973. The crowning honor was winning the National Coal Mine Rescue Team Championship for their fine performance at the national competition in Louisville, Kentucky, in September.

which includes capacitors and synthetic crystal substrates for integrated circuits. Overall production capacity for this business is being increased by 50 per cent. The second is clinical diagnostic systems for hospitals and private laboratories. An important product is the CENTRIFICHEM high-speed blood analyser, sales of which were five times higher than in 1972—the first full year of effort.

Other areas being actively pursued include agricultural systems; coal conversion, for which Union Carbide has proprietary gasification technology; and new ultrafiltration systems for treating industrial process or waste streams, already proving beneficial in cleaning up processing water in automobile production.

The U.S. Atomic Energy Commission recently renewed for another five years its contract with Union Carbide for operation of facilities at Oak Ridge, Tennessee, and Paducah, Kentucky. A $900 million expansion of government-owned uranium enrichment facilities is under way. A study program undertaken by the Corporation and two other companies (Westinghouse and Bechtel) to determine whether uranium enrichment would be a viable business for private industry is still in progress. The study is scheduled for completion in mid-1974.

Programs in the Public Interest

Union Carbide recognizes its obligation to be a good worldwide citizen—to see that its plants everywhere are operated with regard for the community and enhancement of the quality of life.

Investment in pollution-control equipment and facilities for operations in the U.S. and Puerto Rico was $28 million in 1973, and is expected to average approximately $30 million per year for the next ten years.

Important accomplishments in the U.S. in 1973 included the completion of a three-year air-pollution abatement effort at the Marietta, Ohio, ferroalloys plant and steam power station; an extensive redesigning and rebuilding of electrode furnaces at Clarksburg, West Virginia, and Columbia, Tennessee; expanded water-pollution control programs that are under way at several of the largest locations, including the Taft, Louisiana, chemical plant, where secondary wastewater treatment facilities, including Union Carbide's proprietary UNOX system, were completed; and land reclamation projects to restore mine waste areas. Affiliates around the world also have been making progress in environmental control.

Equally important are waste-control systems and products that Union Carbide has made available to industry and communities. At the end of 1973, more than 100 UNOX systems for treating municipal and industrial wastewater were in operation, under construction, or under design—with a total treatment capacity of 5 billion gallons per day.

A 200-ton-per-day prototype of the Corporation's new PUROX solid-waste converter, which turns community and industrial trash into a fuel gas and a usable residue, is scheduled to start up at South Charleston, West Virginia, early in 1974. Many municipalities and industrial plants are interested in the outcome of the project.

An important step was taken in 1973 in the battle to save decaying fresh water lakes. Three lakes in the U.S. were aerated or treated with oxygen during the summer, in an effort to counteract eutrophication. Results were encouraging.

In Puerto Rico, an unusual ecology kit developed by Union Carbide is being used to teach 14,000 first-to-third-grade students in schools near the Corporation's plants the basic concepts of the preservation of air, land, and water resources.

In New York City, Union Carbide people on loan to the Economic Development Council are helping community leaders apply business skills to bring greater efficiency to the court and educational systems.

Human Resources

Emphasis continues to be placed on management training and career development at Union Carbide. The unified Management System begun in 1972 is being extended to include key employees wherever the Corporation has operations around the world.

During 1973, Union Carbide made further progress toward its equal employment goals, with an increasingly significant number of women and members of minority groups now working in management positions and in sales and technical jobs.

Labor relations in the U.S. during the year were generally good, and labor contract settlements were consistent with government regulations. Safety performance continued to improve, and a new all-time record low rate of disabling injuries was achieved, bettering the previous record low set in 1972.

Following stockholder approval at the annual meeting in April, major improvements were made in the Retirement Program and Savings Plan for employees.

Key Management Changes

The Corporation suffered a great loss with the sudden death in November of Robert D. Bower, who had been elected a Vice-President of the Corporation in charge of all operations and activities of Chemicals and Plastics in August 1973. Also elected Vice-Presidents of the Corporation during the year were Morse G. Dial, Jr., James S. Freeman, and Richard J. Hughes. Mr. Dial has responsibility for government and public relations as well as environmental and regional affairs, and Mr. Freeman for employee and related activities. Mr. Hughes assumed responsibility for Chemicals and Plastics following Mr. Bower's death. Dwight N. Wait was elected Chairman of Union Carbide Africa and Middle East. Ronald S. Wishart, Jr., was appointed Director of Feedstock and Energy Policy. Alan C. Egler was named President of the newly formed Home and Automotive Products Division; Arthur C. MacLeod was appointed President—Operations, Chemicals and Plastics; and James B. Reid, President—Commercial, Chemicals and Plastics.

A 5195 Boc RX 188-L

Financial Review

Domestic (United States and Puerto Rico) and International Contributions to Consolidated Sales and Net Income

Sales

	1973		1972		Per Cent Change
	Millions of Dollars	Per Cent of Total	Millions of Dollars	Per Cent of Total	1973 vs. 1972
Domestic Operations	$2,599.1	66	$2,270.5	70	+14
International Operations	1,339.7	34	990.8	30	+35
Total UCC Consolidated	$3,938.8	100	$3,261.3	100	+21

Net Income*

	1973			1972			Per Cent Change
	Millions of Dollars	Per Share	Per Cent of Total	Millions of Dollars	Per Share	Per Cent of Total	1973 vs. 1972
Domestic Operations	$202.9	$3.33	70	$142.3	$2.34	69	+43
International Operations	88.0	1.45	30	62.9	1.04	31	+40
Total UCC Consolidated	$290.9	$4.78	100	$205.2	$3.38	100	+42

Consolidated Sales and Income Contributions by Lines of Business*

	Sales (Millions of Dollars)		Income Contributions (Millions of Dollars)	
	1973	1972	1973	1972
Chemicals and Plastics	$1,674	$1,358	$212	$130
Gases and Related Products, Metals and Carbons	1,424	1,170	202	150
Consumer and Related Products	841	733	134	105
	$3,939	$3,261	$548	$385

Consolidated Sales by Major Classes of Products**

	1973		1972		Per Cent Change
	Millions of Dollars	Per Cent of Total	Millions of Dollars	Per Cent of Total	1973 vs. 1972
Chemicals	$1,068	27	$ 906	28	+18
Plastics	606	15	452	14	+34
Gases and Related Products	581	15	479	15	+21
Metals and Carbons	843	22	691	21	+22
Consumer and Related Products	841	21	733	22	+15
	$3,939	100	$3,261	100	+21

Consolidated Sales and Income Per Share by Quarter***

	Sales (Millions of Dollars)		Income Before Extraordinary Items Per Share		Net Income Per Share	
	1973	1972	1973	1972	1973	1972
1st Quarter	$ 905.5	$ 759.6	$1.09	$0.82	$1.09	$0.84
2nd Quarter	962.3	810.1	1.27	0.86	1.27	0.89
3rd Quarter	1,027.1	817.3	1.20	0.76	1.20	0.76
4th Quarter	1,043.9	874.3	1.22	0.98	1.22	0.89
	$3,938.8	$3,261.3	$4.78	$3.42	$4.78	$3.38

*In 1973, Net Income from Domestic Operations includes $3.6 million ($0.06 per share) from recovery of damages under patent litigation, and Net Income from International Operations includes a $17.3 million ($0.28 per share) net charge from abnormal property retirements at Cubatao, Brazil, partially offset by gains on sale of assets of Bakelite Xylonite Limited, a plastics manufacturing company in the United Kingdom. With respect to the foregoing 1973 items, Income Contributions for Chemicals and Plastics includes a net charge of $27 million, and for Gases and Related Products, Metals and Carbons, a gain of $7 million.

**The former Materials Systems Division was discontinued effective December 31, 1972. Accordingly, sales of Materials Systems, which were separately stated at $79 million in the 1972 Annual Report, have been apportioned between Gases and Related Products, and Metals and Carbons, for both 1973 and 1972.

***Net sales displayed above for each of the first three quarters of 1973 are lower than originally reported in quarterly statements by $9.8, $11.3, and $14.6 million, respectively, as it has been determined that these sales represented intercompany transactions. Net income is not affected because of the corresponding reduction in plant cost and distribution expense.

A 5196 BOC RX 188-M

Domestic Sales by Markets

	Per Cent	
	1973	1972
Chemicals and Allied Products	21	21
Primary Metal Industries	21	19
Rubber and Miscellaneous Plastics Products	12	12
Food and Kindred Products	3	4
Machinery	5	4
Transportation Equipment	2	2
Petroleum and Coal Products	2	2
Other Manufacturing	4	5
Total Manufacturing	70	69
Wholesale and Retail	24	25
Agriculture	2	2
Public Administration	2	2
All Other	2	2
	100	100

* Domestic customer sales have been classified by the Standard Industrial Classification according to the customer's immediate use.

Domestic Price Index

	1973	1972
Basis: 1957-1959 average = 100	80	79

Employees

	Year-End	
	1973	1972
Domestic Operations	54,590	51,179
International Operations	54,827	46,935
Total UCC Consolidated	109,417	98,114
The foregoing figures do not include the following:		
Employees at nuclear energy installations operated for the U.S. Government at Oak Ridge, Tenn., and Paducah, Ky.	14,257	15,072
Employees of companies 20 to 50 per cent owned	5,684	13,351
	Millions of Dollars	
	1973	1972
Total domestic employment costs (excluding those at government-owned facilities)	$757.0	$690.7

Taxes

	1973	1972
Effective income tax rates	44.5%	42.5%

For further information regarding income taxes, see Note 8 on page 17.

Construction Expenditures

	Millions of Dollars	
	1973	1972
United States and Puerto Rico	$196	$158
Europe	27	18
Pan America (includes Canada)	44	43
Far East	13	20
Africa and Middle East	9	5
Total Consolidated Companies	$289	$244
Companies 20 to 50 per cent owned	$ 19	$ 32

Financing

The Corporation held a domestic portfolio of short-term, high-grade securities amounting to $339 million at year-end 1973, compared with $133 million at year-end 1972.

Various lines of credit are available to the Corporation and its subsidiaries. The principal line of credit arrangement, with 23 banks in the United States, permits the Corporation to borrow up to $300 million on 90-day notes at the prime rate of interest. There were no borrowings under this arrangement during 1973.

Short-term borrowings shown on the consolidated balance sheet include the following:

	Millions of Dollars	
	Dec. 31, 1973	Dec. 31, 1972
Domestic	$ 31.9	$ —
International	86.9	68.8
Total	$118.8	$68.8

During 1973, the Corporation arranged to finance certain pollution-abatement facilities at installations in West Virginia and Illinois through industrial development revenue bonds in the amount of $32 million.

International Balance of Payments

In 1973, Union Carbide again had a favorable balance of payments amounting to $144 million, compared with $201 million in 1972. Principal contributing factors are tabulated below.

	Millions of Dollars	
	1973	1972
Exports from the U.S. and Puerto Rico		
To Customers	$161	$126
To Subsidiaries	185	141
Total Exports	$346	$267
Net Dividends from International Affiliates	$ 35	$ 21

The tabulations in this Financial Review section do not include sales of companies 20 to 50 per cent owned; however, income data include UCC's share of their income. Income contributions are before provision for income taxes, minority stockholders' share of income, UCC's share of income of 20 to 50 per cent owned companies, and extraordinary items. For further details, see Notes 1, 2, and 10 on pages 16 and 18.

In July 1973, the Corporation increased its interest in Bakelite Xylonite Limited from 50 per cent to 100 per cent, as a result of which sales of this company were thereafter included in consolidation. The effect of this change on net income is not material. If adjustment is made to include nonconsolidated sales of this company in both years (1973 first 6 months: $78.8 million; 1972: $128.2 million), the year-to-year gain in plastics sales amounts to 18 per cent, in international sales to 27 per cent, and in total UCC consolidated sales to 19 per cent. Employees of Bakelite Xylonite Limited, included in International Operations at year-end 1973, and in companies 20 to 50 per cent owned at year-end 1972, numbered 5,911 and 8,016, respectively.

A 5197 BOC RX 188-D

Consolidated Statement of Income and Retained Earnings
Union Carbide Corporation and Subsidiaries

	Millions of Dollars (Except Per Share Figures)	
	Year Ended Dec. 31, 1973	Year Ended Dec. 31, 1972
Net Sales	$3,938.8	$3,261.3
Deductions		
Plant Cost and Distribution Expense	2,592.0	2,134.1
Research and Development	76.8	69.6
Selling, Administrative, and Other Expenses	426.2	376.8
Depreciation and Depletion	245.2	245.2
	3,340.2	2,825.7
Income from Operations	598.6	435.6
Other Income—Net	10.3	5.6
Less: Interest on Long- and Short-Term Debt	60.6	56.1
Income Before Provision for Income Taxes	548.3	385.1
Provision for Income Taxes		
Current	219.5	143.9
Deferred	24.4	19.6
Total	243.9	163.5
Income Before Minority Stockholders' Share of Income and UCC Share of Income of Companies Carried at Equity	304.4	221.6
Less: Minority Stockholders' Share of Income	24.5	18.0
	279.9	203.6
Plus: UCC Share of Income of Companies Carried at Equity	11.0	3.8
Income Before Extraordinary Items	290.9	207.4
Per Share*	$4.78	$3.42
Extraordinary Items—Net of Tax	—	(2.2)
Per Share*	—	$(0.04)
Net Income	290.9	205.2
Per Share*	$4.78	$3.38
Retained Earnings at January 1	1,618.0	1,534.1
	1,908.9	1,739.3
Dividends Declared	126.1	121.3
Per Share	$2.075	$2.00
Retained Earnings at December 31	$1,782.8	$1,618.0

*Based on 60,799,585 shares (60,659,016 shares in 1972), the weighted average number of shares outstanding during the year.

Certain 1972 expenses have been reclassified to conform with the 1973 presentation. In accordance with Opinion 30 of the Accounting Principles Board of the American Institute of Certified Public Accountants, 1973 nonrecurring gains and losses have been included in Other Income—Net and similar items reported as Extraordinary in 1972 have not been restated. For details, see Note 10 on page 18.

The Notes to Financial Statements on pages 16 through 18 are an integral part of this statement.

A 5198 BOC Rx 188-0

Consolidated Balance Sheet
Union Carbide Corporation and Subsidiaries

Assets	Millions of Dollars Dec. 31, 1973	Dec. 31, 1972
Current Assets		
Cash	$ 82.5	$ 99.7
Time Deposits and Short-Term Marketable Securities	469.0	161.9
	551.5	261.6
Notes and Accounts Receivable	687.2	576.9
Inventories	752.9	743.2
Prepaid Expenses	50.8	46.5
TOTAL CURRENT ASSETS	2,022.4	1,828.2
Net Fixed Assets	1,991.2	1,953.9
Investments and Advances		
Companies Carried at Equity	55.9	76.0
Other	11.2	8.2
Other Assets	81.7	52.0
	$4,162.4	$3,718.3
Liabilities and Stockholders' Equity		
Current Liabilities		
Accounts Payable	$ 218.8	$ 158.6
Short-Term Borrowings	118.8	68.8
Payments due within one year on Long-Term Debt	32.3	57.1
Accrued Income and Other Taxes	192.6	142.4
Other Accrued Liabilities	258.1	203.9
TOTAL CURRENT LIABILITIES	820.6	630.8
Deferred Credits	151.1	117.5
Long-Term Debt	939.1	901.1
Minority Stockholders' Equity in Consolidated Subsidiaries	147.4	135.3
UCC Stockholders' Equity	2,104.2	1,933.6
	$4,162.4	$3,718.3

The Notes to Financial Statements on pages 16 through 18 are an integral part of this statement.

A 5199 BOC RX 188-P

Consolidated Statement of Changes in Financial Position
Union Carbide Corporation and Subsidiaries

	Millions of Dollars	
	Year Ended Dec. 31, 1973	Year Ended Dec. 31, 1972
Working Capital at Beginning of Year	$ 997.4	$ 870.7
Additions		
Operations		
Net Income	290.9	205.2*
Depreciation and Depletion	245.2	245.2
Deferred Income Taxes—Noncurrent	19.8	11.8*
Minority Stockholders' Share of Income	24.5	18.0
Working Capital Provided from Operations	580.4	480.2
Decrease in Long-Term Receivables	—	4.6
New Financing		
Long-Term Debt	71.3	42.0
Other	5.7	5.2
Disposals of Net Fixed Assets	45.2**	31.9
	702.6	563.9
Deductions		
Dividends Paid	126.1	121.3
Construction Expenditures	288.7	243.9
Reduction in Long-Term Debt	38.3	58.1
Increase in Long-Term Receivables	26.1	—
Net Noncurrent Assets of an Affiliate Consolidated in 1973	24.3	—
Other—Net	(5.3)	13.9
	498.2	437.2
Increase in Working Capital	204.4	126.7
Working Capital at End of Year	$1,201.8	$ 997.4
Changes in Components of Working Capital		
Cash and Time Deposits and Short-Term Marketable Securities	$ 289.9	$ 146.9
Receivables	90.3	63.7
Inventories	9.7	(12.9)
Prepaid Expenses	4.3	.7
Increase in Current Assets	394.2	198.4
Accounts Payable	60.2	20.9
Short-Term Borrowings	50.0	(37.0)
Other Current Liabilities	79.6	87.8
Increase in Current Liabilities	189.8	71.7
Increase in Working Capital	$ 204.4	$ 126.7

*1972 Net Income includes a charge of $2.2 million due to Extraordinary Items, and 1972 Deferred Income Taxes—Noncurrent includes a charge of $3.6 million due to reversals of deferred tax pertaining to Extraordinary Items.

**1973 Disposals of Net Fixed Assets includes $30.7 million due to abnormal property retirements at Cubatao, Brazil.

The Notes to Financial Statements on pages 16 through 18 are an integral part of this statement.

A 5200

Boc RK 188-Q

Notes to Financial Statements—1973
Union Carbide Corporation and Subsidiaries

1. Summary of Significant Accounting Policies

Principles of Consolidation—The consolidated financial statements include the assets, liabilities, revenues, and expenses of all significant subsidiaries. Investments in significant companies 20 to 50 per cent owned are carried at equity in net assets, and Union Carbide's share of their earnings is included in the income statement. Intercompany transactions have been eliminated. Other investments are carried at cost or less.

Translation of Foreign Currencies—Accounts carried in foreign currencies are translated into U.S. dollars as follows: (a) fixed assets, intangibles, investments, and deferred credits at historical rates; (b) other assets and liabilities at year-end rates; (c) income and expenses at monthly rates, except for depreciation and amortization of those balance sheet accounts translated at historical rates. Gains and losses resulting from exchange rate fluctuations and from forward exchange contracts are credited or charged to income currently, except that in the case of major currency revaluations or devaluations, adjustments arising from the translation of long-term debt are amortized over the remaining terms of the loans.

Marketable Securities—Marketable securities are carried at cost, which approximates market.

Inventories—Inventory values, which do not include depreciation or depletion, are stated at cost or market, whichever is lower. Cost is determined generally on the "last-in, first-out" method for United States companies and the "average cost" method for subsidiaries operating outside the United States.

Fixed Assets and Depreciation—Fixed assets are carried at cost. Expenditures for replacements are capitalized, and the replaced items are retired. Maintenance and repairs are charged to operations. Gains and losses from the sale of property are reflected in income.

Depreciation is calculated on a straight-line basis utilizing the 1962 U.S. Internal Revenue Service guideline lives with respect to depreciable assets acquired subsequent to January 1, 1967. Prior to 1967, the parent company and certain subsidiaries used accelerated depreciation methods for both published reports and income tax purposes. The Corporation and its subsidiaries continue to use other depreciation methods for tax purposes where appropriate.

Research and Development—Research and development costs are charged to expense as incurred.

Income Taxes—Provision has been made for deferred income taxes where differences exist between the time in which transactions, principally relating to depreciation, affect taxable income and the time in which they enter into the determination of income in the financial statements.

The investment tax credit is amortized over the average life of fixed assets by reductions in the Provision for Income Taxes.

Retirement Program—The retirement program of Union Carbide Corporation covers substantially all United States employees and certain employees in other countries. Accrued costs under the United States retirement program are funded for all employees age 25 and over, with prior service costs being amortized over a period not exceeding 40 years. Costs of funded and unfunded pension plans of consolidated subsidiaries are accounted for substantially on an accrual basis.

Net Income Per Share—Net income per share is computed based upon the weighted average number of shares of common stock outstanding in each year. There would have been no material dilutive effect upon net income per share for 1973 or 1972 if convertible securities had been converted and if outstanding stock options granted had been exercised.

2. International Operations

The following is a financial summary of consolidated international subsidiaries and international companies carried at equity:

	Millions of Dollars			
	Year Ended Dec. 31, 1973		Year Ended Dec. 31, 1972	
	Consolidated Subsidiaries	Companies Carried at Equity	Consolidated Subsidiaries	Companies Carried at Equity
Total Assets	$1,436.0	$334.4	$1,171.2	$362.5
Less: Total Liabilities	615.4	236.6	479.3	234.2
Net Assets	820.6	97.8	691.9	128.3
UCC Equity	$ 703.8	$ 48.4	$ 588.6	$ 63.8
Net Sales	$1,339.7	$506.7*	$ 990.8	$434.4*
Net Income	$ 99.5**	$ 21.0	$ 75.0**	$ 6.8
UCC Share	$ 77.6**	$ 10.4	$ 59.6**	$ 3.3

*Exclusive of $12.6 million net sales to UCC and its consolidated subsidiaries in 1973 ($9.8 million in 1972).

**1973 includes a $17.3 million net charge from abnormal property retirements at Cubatao, Brazil, partially offset by gains on sale of assets of an international subsidiary, and 1972 includes a charge of $2.0 million from write-off of assets.

3. Foreign Currency Exchange Adjustments

Net income in 1973 and 1972 was reduced by $1.3 million and $0.4 million, respectively, due to translation of balance sheet accounts carried in foreign currencies, exchange gains and losses, and amortization of exchange adjustments on long-term debt.

4. Supplementary Balance Sheet Detail

	Millions of Dollars December 31,	
	1973	1972
Notes and Accounts Receivable		
Trade	$ 598.2	$ 533.3
Other	82.1	54.2
	680.3	587.5
Less: Allowance for Doubtful Accounts	13.1	10.6
	$ 667.2	$ 576.9
Inventories		
Raw Materials and Supplies	$ 241.1	$ 199.0
Work in Process	198.9	180.8
Finished Goods	312.9	363.4
	$ 752.9	$ 743.2
Fixed Assets		
Land and Improvements	$ 280.0	$ 268.4
Buildings	632.7	608.2
Machinery and Equipment	3,827.7	3,683.6
Construction in Progress and Other	221.5	169.4
	4,961.9	4,729.6
Less: Accumulated Depreciation and Amortization	2,970.7	2,775.7
Net Fixed Assets	$1,991.2	$1,953.9

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4. Supplementary Balance Sheet Detail (continued)

	Millions of Dollars December 31, 1973	1972
Other Assets		
Deferred Charges*	$ 21.4	$ 22.7
Long-Term Receivables	49.1	23.0
Patents, Trade Marks, and Goodwill	11.2	6.3
	$ 81.7	$ 52.0
Deferred Credits		
Income Taxes**	$ 118.4	$ 99.3
Investment Tax Credit	17.5	9.6
Other	15.2	8.6
	$ 151.1	$ 117.5

*Deferred charges include foreign currency exchange adjustments on long-term debt amounting to $2.9 million in 1973 ($6.0 million in 1972).
**Deferred income taxes related to current items are included in accrued income and other taxes in the amount of $29.9 million in 1973 ($25.3 million in 1972).

5. Long-Term Debt

	Millions of Dollars December 31, 1973	1972
UNION CARBIDE CORPORATION AND DOMESTIC SUBSIDIARIES		
8.50% Notes due semiannually to 1984	$165.0	$180.0
4.50% Notes due semiannually to 1996	45.1	47.0
3.625% Notes due semiannually to 1990, issued at a discount to yield lenders 4.50% per annum over the term of the notes	42.5	45.0
4.50% Notes due annually, 1985 to 1994	200.0	200.0
4.75% Guaranteed Debentures due 1952, convertible into Union Carbide Corporation common stock at $56.50 per share	50.0	50.0
5.00% Sinking Fund Debentures, equal annual sinking fund payments, 1978 to 1997	250.0	250.0
6.3125% Loan payable in Deutsche marks, due 1973, to refinance 7.25% Loan	—	19.4
6.50% and 6.60% Notes, payable in Belgian francs, renewable annually to 1975	48.0	45.0
7.875% Eurodollar loan due quarterly, 1975 to 1977	10.0	—
Other	—	5.0
Capitalized Leases and Installment Purchase Obligations	31.8	—
INTERNATIONAL SUBSIDIARIES		
Various maturities and interest rates	129.0	116.8
	971.4	958.2
Less: Payments due within one year (included in Current Liabilities)	32.3	57.1
	$939.1	$901.1

Capitalized Leases and Installment Purchase Obligations represent state and local governmental bond financing of pollution-abatement facilities, treated for accounting and tax purposes as debt of Union Carbide Corporation. Periodic lease and installment payments will amortize the principal and interest to maturity in 1998 at an average effective annual interest rate of 5.20 per cent.

International subsidiaries' debt includes $38.4 million due in United States dollars and $90.6 million, representing the amount due in other currencies; $41.9 million is secured by pledges or liens on $151.7 million of international consolidated assets.

Payments due on long-term debt in the four years after 1974 are: 1975, $88.8 million; 1976, $33.7 million; 1977, $35.8 million; 1978, $40.0 million.

Various lines of credit are available to the Corporation and its subsidiaries. The principal line, subject to customary review and annual renewal, permits the Corporation to borrow $300 million on 90-day notes at the prime rate of interest from a group of banks in the United States. There were no borrowings under the $300 million line during 1973.

6. UCC Stockholders' Equity

Capital Stock
Authorized—Preferred Stock .....$1.00 par value.....10,000,000 shares
Common Stock .....$1.00 par value.....90,000,000 shares

	Dollars in Millions Dec. 31, 1973 Shares	Amount	Dec. 31, 1972 Shares	Amount
Issued—Preferred	none	—	none	—
Common	61,559,667	$ 328.7	61,424,156	$ 322.9
Retained Earnings		1,782.8		1,618.0
		2,111.5		1,940.9
Less: Treasury Stock at Cost Held by the Corporation	691,757	7.3	691,757	7.3
	60,867,910	$2,104.2	60,732,399	$1,933.6

Issued shares include 75,516 shares at December 31, 1973 (80,255 shares at December 31, 1972), held by the Corporation as collateral under employee stock purchase agreements. The amount to be paid under these agreements, $3.2 million at December 31, 1973 ($3.4 million at December 31, 1972), has been deducted from common stock (Note 11). During 1973, 4,471 shares were issued under employee stock option plans and 131,040 shares were issued and purchased at market price by the Trustee under the Savings Plan for Employees.

7. Non-Capitalized Leases and Rentals

Total lease and renewal payments were $43 million in 1973 and $42 million in 1972. The following amounts represent future payment commitments under noncancelable operating and financing leases extending for one year or more:

	Millions of Dollars 1974	1975	1976	1977	1978	1979/ 1983	1984/ 1988	1989/ 1993	After 1993
Distribution Equipment and Facilities	$18	$15	$12	$11	$ 9	$37	$30	$17	$ 5
Office Space	5	4	4	3	2	9	2	1	7
Other	5	3	2	1	1	5	4	4	3
Total	$28	$22	$18	$15	$12	$51	$36	$22	$15

If financing leases had been capitalized, the impact on net income would not have been material.

8. Income Taxes

Investment tax credit applicable to owned and leased assets placed in service in the United States in 1973 amounted to $10.4 million ($8.[illegible] million in 1972). This amount is being amortized over the average life of fixed assets by reductions in the Provision for Income Taxes.

The following is an analysis of income tax expense:

	Millions of Dollars 1973 Current	Deferred	Current	Deferred
U.S. Federal Income Taxes	$120.6	$1[illegible]	$ 63.6	$19.[illegible]
U.S. Investment Tax Credit	(9.8)		(7.3)	7.5
U.S. State and Local Taxes Based on Income	10.6		7.3	—
Non-U.S. Income Taxes	98.1	(2.[illegible])	80.3	(7.3)
	219.5	24.4	143.9	19.6
Tax Related to Extraordinary Items	—	—	1.9	(3.6)
	$219.5	$24.4	$145.8	$16.[illegible]

*1973 includes $14.0 million ($16.1 million in 1972) related to depreciation timing differences.

The consolidated effective income tax rate was 44.5 per cent in 1973 and 42.5 per cent in 1972. Excluding the effects of state and local taxes based on income, the major difference between an assumed 48 per cent United States income tax rate and the actual rate of income tax accrued in both years relates to income taxes of companies operating outside the United States.

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Consolidated retained earnings include undistributed earnings of affiliates accumulated over many years of approximately $430 million after applicable income taxes provided by these affiliates. The Corporation has determined that no additional provision for taxes is required since these earnings have been or will be reinvested indefinitely.

9. Retirement Program

The retirement program cost for 1973, including the cost of funded and unfunded pension plans of consolidated international subsidiaries, which are accounted for substantially on an accrual basis, amounted to $64.1 million. The corresponding amount for 1972 was $46.0 million. Plan funds exceed the actuarial liability for benefits vested with employees.

10. Other Income—Net and Extraordinary Items

Other Income—Net in 1973 includes a loss of $33.6 million ($23.2 million after tax, or $0.38 per share) resulting from abnormal property retirements at Cubatao, Brazil, income of $7.0 million ($3.6 million after tax, or $0.06 per share) from recovery of damages under patent litigation, and a gain of $6.5 million ($5.9 million after tax, or $0.10 per share) resulting from the sale of assets of a subsidiary in the United Kingdom. The account also includes investment income of $33.7 million principally from short-term investments.

Extraordinary items in 1972 consist of (a) nonrecurring net gains aggregating $6.7 million (after applicable tax of $3.6 million), or $0.11 per share, resulting from sales of businesses and other property and (b) nonrecurring net charges of $8.9 million (after applicable tax of $5.3 million), or $0.15 per share, resulting principally from abnormal property retirements.

11. Incentive Programs

In 1965, the stockholders approved the 1965 Stock Option Plan. Previously in 1959, the Union Carbide Incentive Plan had been approved. The periods during which awards could be granted under the 1965 Stock Option Plan and 1959 Incentive Plan expired in April 1970 and April 1964, respectively.

Under the 1965 Stock Option Plan, awards could be granted to employees in the form of either (a) options to purchase common stock, or (b) dividend equivalents with an accompanying option to purchase an equal number of shares of common stock of the Corporation. Options expire at the end of five years unless terminated earlier in accordance with the terms of the Plan. Options may be exercised by payment in cash, or when exercised during employment by signing a purchase contract payable within five years. Shares sold under a purchase contract are held by the Corporation as collateral and are released as payments therefor are completed, subject to the provisions of Regulation G of the Federal Reserve Board. Option prices were 100 per cent of the fair market value per share on the date of the grant.

A "dividend equivalent" means the right to receive payments equivalent in value to dividends paid in cash on one share of common stock of the Corporation. Dividend equivalents were awarded for life unless forfeited under the terms of the Plan or terminated by exercise of the accompanying options.

The 1959 Union Carbide Incentive Plan provided for awards similar to those under the 1965 Stock Option Plan, except that options granted were for a period of ten years and the option prices were 95 per cent of the fair market value per share on the date of grant.

At December 31, 1972, there were 793,745 shares of common stock available for issuance under outstanding options. During 1973, 472,390 options were canceled or expired and 4,471 options were exercised. At December 31, 1973, options outstanding, held by 236 participants, covered 316,884 shares and the dividend equivalents outstanding (5,000 with accompanying options) totaled 1,083,440.

Report of Independent Certified Public Accountants

To Directors and Stockholders of
Union Carbide Corporation:

We have examined the consolidated balance sheet of Union Carbide Corporation and its subsidiaries as of December 31, 1973 and the related consolidated statements of income and retained earnings and of changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the financial statements identified above present fairly the financial position of Union Carbide Corporation and its subsidiaries consolidated at December 31, 1973, and the results of their operations and the changes in their financial position for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

140 Broadway
New York, N.Y.
February 15, 1974

Haskins & Sells

Certified Public Accountants

Ten-Year Summary
Union Carbide Corporation and Consolidated Subsidiaries

(Dollars in Millions and Shares in Thousands—Except Per Share Figures)

	1973	1972	1971	1970	1969	1968	1967	1966	1965	1964
Net Sales	$3,939	$3,261	$3,038	$3,026	$2,933	$2,686	$2,546	$2,587	$2,339	$2,097
Sales by Lines of Business										
Chemicals and Plastics	1,674	1,358	1,221	1,211	1,177	1,095	1,035	1,062	1,012	923
Gases and Related Products, Metals and Carbons	1,424	1,170	1,121	1,156	1,134	1,035	1,015	1,038	907	803
Consumer and Related Products	841	733	696	659	622	556	496	487	420	371
Net Income*										
Amount	290.9	205.2	157.8	157.3	186.2	157.0	170.7	239.6	239.1	200.1
Per Share	4.78	3.38	2.61	2.60	3.08	2.60	2.82	3.97	3.96	3.32
Dividends Declared										
Amount	126.1	121.3	*121.1	121.0	121.0	120.9	120.9	120.8	120.7	108.4
Per Share	2.075	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.80
% of Net Income	43.4%	59.1%	76.7%	76.9%	65.0%	77.0%	70.8%	50.4%	50.5%	56.0%
Shares Outstanding (at Dec. 31)	60,868	60,732	60,568	60,479	60,479	60,465	60,454	60,423	60,388	60,234
Total Assets	$4,162	$3,718	$3,555	$3,564	$3,356	$3,209	$3,088	$2,760	$2,566	$2,280
UCC Stockholders' Equity										
Amount	2,104	1,934	1,844	1,805	1,767	1,701	1,665	1,608	1,480	1,348
Per Share	*34.57	31.84	30.45	29.84	29.22	28.14	27.54	26.61	24.51	22.38
Construction Expenditures	268.7	243.9	335.2	393.7	322.2	347.1	478.7	393.6	282.6	293.4
Depreciation and Depletion	245.2	245.2	229.3	236.4	250.0	230.8	230.8	206.9	195.5	174.7
Employees at Year-End (excludes those at government-owned facilities)	109,417	98,114	99,181	102,144	104,411	100,448	99,794	101,785	92,259	90,404

*Net income for the year 1972 includes a charge from extraordinary items—net of tax of $2.2 million ($0.04 per share); and for 1971 and 1964 includes income from extraordinary items—net of tax of $4.8 million ($0.08 per share) and $6.6 million ($0.11 per share), respectively.

Net income per share based on weighted average number of shares outstanding during the year; UCC stockholders' equity based on number of shares outstanding at Dec. 31. Shares outstanding and per share data adjusted for two-for-one stock split in 1965.

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Union Carbide Corporation/Operating Units

Executive Vice-President: **W. M. Anderson**

Chemicals and Plastics

R. J. Hughes, *Vice-President, UCC*
A. C. MacLeod, *President*—Operations
J. B. Reid, *President*—Commercial

Union Carbide produces and markets over 800 different chemicals and numerous formulations of basic plastics used in a wide variety of industries. Among the products are chemicals for making adhesives and sealants, agricultural and biochemical products, cosmetics, detergents, foams (such as urethane) fumigants, paints and other coatings, petroleum products, pharmaceuticals, and textiles. Major chemical products are ethylene oxide and its derivatives, coatings solvents, SEVIN and TEMIK insecticides, UCON refrigerants and propellants, and silicone surfactants. The plastics produced by this group include phenolic, polystyrene, polysulfone, and vinyl resins.

Home and Automotive Products, Films—Packaging, and Polyethylene

E. E. Tarka, *Vice-President, UCC*
A. C. Egler, *President*, Home and Automotive Products Division
G. E. Bailie, *President*, Films—Packaging Division

Automotive products include specially formulated coolants marketed under the well-known PRESTONE trade mark, as well as under custom brands, to protect the cooling systems of automobiles against freeze-ups in winter and overheating in summer. In the car care line are also polishes, brake fluids, engine tune-up chemicals, and ice fighters marketed under PRESTONE and UNION CARBIDE brand names. Among the home products are the popular GLAD line of plastic bags, wrap, and drinking straws; and "6-12 PLUS" insect repellent. A line of jewelry products is also marketed, including LINDE stars and LINDE simulated diamonds.

The Films—Packaging Division produces and markets cellulose and plastic films and sheeting. Four of the Division's major products are cellulose casings used to form skinless frankfurters, polyethylene film, vinyl film and sheeting, and nonflammable DYNEL modacrylic fiber.

Many different forms of polyethylene and ethylene copolymer resins are produced offering a wide variety of fabricating and end-product properties. Principal uses for these resins are in making films for countless packaging applications; molded and extruded products such as housewares and toys; wire and cable jacketing and insulation; coatings for paper, paperboard, and foil; and adhesives for paper and nonwoven fabrics.

Union Carbide Puerto Rico, Inc.

A. Celaya, Jr., *Chairman*

This wholly owned subsidiary coordinates Union Carbide's activities in Puerto Rico. Operations on the island include a petrochemicals complex, a food casings plant, and a graphite electrode plant.

Union Carbide Europe, Inc.

J. C. Malone, *Chairman, and Vice-President, UCC*
A. A. Boehm, *Vice-Chairman*

This subsidiary represents the Corporation's interests in the United Kingdom and Continental Europe. Major producing companies in this area are:

MAJORITY OWNED

BELGIUM	Union Carbide Belgium
FRANCE	La Littorale S.A.
	Union Carbide France S.A.
GERMANY (WEST)	Union Carbide Deutschland G.m.b.H.
GREECE	Union Carbide Hellas Industrial and Commercial S.A.
ITALY	Union Carbide Italia S.p.A.
	Elettrografite Meridionale S.p.A.
	Unilig S.p.A.
NORWAY	A/S Meraker Smelteverk
	A/S Saudefaldene
	Electric Furnace Products Company, Limited
SPAIN	Union Carbide Iberica, S.A.
	Union Carbide Navarra, S.A.
SWEDEN	Union Carbide Norden AB
UNITED KINGDOM	Bakelite Xylonite Limited
	British Acheson Electrodes Limited
	Union Carbide U.K. Limited

50 PER CENT OWNED

BELGIUM	Evipak S.A.
FRANCE	Tamimo S.A.
	Viscora, S.A.
SPAIN	Argon, S.A.
SWEDEN	Unilos Kemi AB
UNITED KINGDOM	Viskase Limited

Executive Vice-President: **D. H. Freeman**

Battery Products Division

J. M. Rehfield, *President*

More than 1,000 different types of batteries are marketed by this Division under the EVEREADY and HERCULES trade marks, as well as under custom brands. These batteries are used in flashlights, radios, television sets, tape recorders, phonographs, hearing aids, photographic equipment, toys, and a variety of cordless appliances. Other EVEREADY products include flashlight cases, lamps, and lanterns.

Union Carbide Eastern, Inc.

B. T. Burgoyne, *Chairman, and Vice-President, UCC*

This subsidiary has responsibility for interests in the Far East. Major producing companies are:

MAJORITY OWNED

AUSTRALIA	Union Carbide Australia Limited
HONG KONG	Sonca Industries Limited
INDIA	Union Carbide India Limited
INDONESIA	P. T. Union Carbide Indonesia
JAPAN	Union Carbide Services Eastern Limited
MALAYSIA	Union Carbide Malaysia Sdn. Bhd.
NEW ZEALAND	Union Carbide New Zealand Limited
PHILIPPINES	Union Carbide Philippines, Inc.
REPUBLIC OF SRI LANKA	Union Carbide Ceylon Limited
SINGAPORE	Metals and Ores Pte. Limited
	Union Carbide Singapore Pte. Limited
THAILAND	Union Carbide Thailand Limited

50 PER CENT OWNED

JAPAN	Nippon Unicar Company Limited
	Shin Nippon Carbon Company, Ltd.
	Showa Union Gosei Co., Ltd.
	Showa Unox K.K.
	Union Showa K.K.
THAILAND	Thailand Exploration and Mining Company Limited
	Thailand Smelting and Refining Company Limited

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Union Carbide Pan America, Inc.

J. H. Jones, *Chairman*

The Corporation's interests in Latin America are represented by this subsidiary. Major producing companies are:

	MAJORITY OWNED
ARGENTINA	Union Carbide Argentina S.A.I.C.S.
BRAZIL	S.A. White Martins
	S.A. White Martins Nordeste
	Union Carbide do Brasil S.A.I.C.
COLOMBIA	Union Carbide Colombia, S.A.
COSTA RICA	Union Carbide Centro Americana, S.A.
ECUADOR	Union Carbide Ecuador C.A.
MEXICO	Union Carbide Mexicana, S.A.
VENEZUELA	Union Carbide de Venezuela, C.A.

Executive Vice-President: F. B. O'Mara

Carbon Products Division

F. B. Vernon, *President*

This Division produces carbon and graphite (highly refined carbon) in thousands of shapes and forms. Electrodes for furnaces used in making steel, iron, alloys, abrasives, and phosphorus are its most important product line. Arc carbons are produced for motion-picture projection and studio lighting, solar simulation, and spectroscopic analysis. Special products are made for aerospace, chemical, electrical, mechanical, metallurgical, and nuclear use. High-temperature refractory materials are also produced.

Ferroalloys Division

F. C. Kroft, Jr., *President*

This Division is a major supplier of chromium, manganese, and silicon alloys. The alloys are basic ingredients used in making all types of ferrous metals—including the large-tonnage carbon steels, stainless steels, special alloy steels, and cast irons—as well as such nonferrous metals as aluminum. The Division also mines coal for internal consumption. In addition, it is a major supplier of calcium carbide used in metallurgical and chemical applications.

Linde Division

J. G. Benson, *President*

The major activity of this Division is the production of purified gases—primarily oxygen, nitrogen, argon, hydrogen, helium, and acetylene. They are used in the production and fabrication of steel and other metals, in the aerospace program, in chemical and petroleum processing operations, and in wastewater treatment. The Division manufactures equipment used in various industrial processes, such as cryogenic equipment for production and storage of gases, for welding and flame-cutting, and for POLARSTREAM liquid nitrogen refrigeration for in-transit preservation of food. It also markets proprietary processes for the refinement of stainless steel (argon-oxygen decarburization) and for the purification of industrial and municipal wastewaters (UNOX system). The Division produces and markets molecular sieves, highly efficient adsorbents and catalysts used by the petroleum, natural gas, and chemical industries. In addition, it provides a service for applying high-performance coatings to critical wear parts.

Mining and Metals Division

J. C. Stephenson, *President*

This Division has responsibility for worldwide minerals exploration; domestic mining and processing of tungsten, vanadium, and uranium ores; and production of certain specialty metals and alloys. For example, it supplies combinations of aluminum and such metals as chromium, manganese, and iron to the aluminum industry; vanadium for high-strength steels used in structural applications and line pipe; uranium concentrates for nuclear energy operations; and high-purity asbestos for tile, paper, plastics, and rubber.

Union Carbide Canada Limited

J. S. Dewar, *President*

This subsidiary, which is 25 per cent owned by the Canadian public, carries on widely diversified activities in the fields of chemicals, plastics, gases, metals, carbons, fibers, and consumer products. It has approximately 5,000 employees and has 42 plants, 8 laboratories, and 30 sales offices throughout Canada.

Union Carbide Africa and Middle East, Inc.

D. N. Walt, *Chairman*

The Corporation's interests in Africa and the Middle East are represented by this subsidiary. Major producing companies include:

	MAJORITY OWNED
GHANA	The African Manganese Company Limited
	Ucar Plastics (Ghana) Limited
	Union Carbide Ghana Limited
IRAN	Union Carbide Iran S.A.
IVORY COAST	Union Carbide Cote d'Ivoire
KENYA	Union Carbide Kenya Limited
REPUBLIC OF SOUTH AFRICA	Chrome Corporation (South Africa) (Proprietary) Limited
	Ruighoek Chrome Mines (Proprietary) Limited
	Ucar Chrome Company (S.A.) (Proprietary) Limited
	Ucar Minerals Corporation
RHODESIA	The African Chrome Mines Limited
	Rhodesia Chrome Mines Limited
	Union Carbide Rhemet (Private) Limited
	50 PER CENT OWNED
REPUBLIC OF SOUTH AFRICA	Elektrode Maatskappy Van Suid Afrika (Eiendoms) Beperk

Corporate Technology and New Business Development

T. R. Miller, *Vice-President, UCC*

This group has responsibility for pursuing new business opportunities for the Corporation, including both new products and new markets that fall outside the areas of responsibility of the major operating units. It follows research projects through their developmental phase on through early commercial operation.

Nuclear Division

R. F. Hibbs, *President*

Through the Nuclear Division, Union Carbide operates government-owned nuclear energy facilities at Oak Ridge, Tennessee, and Paducah, Kentucky. These facilities include gaseous diffusion plants for separating uranium isotopes; special production and research units that fabricate components for defense use; and Oak Ridge National Laboratory—one of the world's largest nuclear research centers.

Union Carbide's Directors and Officers

DIRECTORS

R. Manning Brown, Jr.
Chairman, New York Life Insurance Company

Roberto de Jesus Toro
President, Banco de Ponce (Puerto Rico)

James L. Ferguson
President and Chief Executive Officer General Foods Corporation

J. Victor Herd
Director, The Continental Corporation and The Continental Insurance Companies

James M. Hester
President, New York University

Jerome H. Holland
Director of Various Corporations

James R. Johnstone
Vice-Chairman

Allen T. Lambert
Chairman and Chief Executive Officer The Toronto-Dominion Bank

Frank R. Lyon, Jr.
Vice-President and General Counsel

Birny Mason, Jr.
Chairman of the Executive Committee

Robert E. McNeill, Jr.
Retired Chairman Manufacturers Hanover Corporation

William B. Nicholson
Vice-Chairman

William S. Sneath
President and Chief Operating Officer

J. Harris Ward
Retired Chairman Commonwealth Edison Company

F. Perry Wilson
Chairman of the Board and Chief Executive Officer

MANAGEMENT COMMITTEE

F. Perry Wilson, *Chairman*
William S. Sneath
James R. Johnstone
William B. Nicholson
Warren M. Anderson
Douglas H. Freeman
Fred B. O'Mara

EXECUTIVE COMMITTEE

Birny Mason, Jr., *Chairman*
J. Victor Herd
Frank R. Lyon, Jr.
William S. Sneath
F. Perry Wilson

AUDIT COMMITTEE

J. Harris Ward, *Chairman*
J. Victor Herd
Allen T. Lambert

COMPENSATION COMMITTEE

Robert E. McNeill, Jr., *Chairman*
R. Manning Brown, Jr.
James L. Ferguson
Birny Mason, Jr.

PUBLIC POLICY COMMITTEE

James M. Hester, *Chairman*
Roberto de Jesus Toro
Jerome H. Holland
William S. Sneath

OFFICERS

F. Perry Wilson, *Chairman of the Board and Chief Executive Officer*

William S. Sneath
President and Chief Operating Officer

James R. Johnstone, *Vice-Chairman*

William B. Nicholson, *Vice-Chairman*

Warren M. Anderson
Executive Vice-President

Douglas H. Freeman
Executive Vice-President

Fred B. O'Mara
Executive Vice-President

Buhl T. Burgoyne, *Vice-President*

Morse G. Dial, Jr., *Vice-President*

Robert F. Flood, *Vice-President*

James S. Freeman, *Vice-President*

Richard J. Hughes, *Vice-President*

Frank R. Lyon, Jr.
Vice-President and General Counsel

James C. Malone, *Vice-President*

Thomas R. Miller, *Vice-President*

William E. Pardoe
Vice-President and Chief Financial Officer

John F. Shanklin
Vice-President and Secretary

Elio E. Tarika, *Vice-President*

George C. Wells, *Vice-President*

Stephen E. Nightingale, *Treasurer*

John A. Willis, *Controller*

Norman J. Hearn
Regional Vice-President (Far West)

Fred L. Shanklin
Regional Vice-President (Midwest)

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SHIPMENTS - ACETYLENE

Year	Total		Method of Distribution			
			Pipelines		Produced for Compression	
	Value*	Quantity+	Percent of Total Value	Percent of Total Quantity	Percent of Total Value	Percent of Total Quantity
1972	94.5	7.2	55.1	79.2	44.9	20.8
1971	102.6	7.7	56.8	80.5	43.2	19.5
1970	98.9	8.9	--++	--	--	--
1969	98.5	9.4	--	--	--	--
1968	89.0	8.2	--	--	--	--
1967	87.1	8.2	--	--	--	--
1966	97.5	9.5	--	--	--	--
1965	98.0	9.7	--	--	--	--
1964	100.3	9.4	--	--	--	--
1963	94.5	8.9	--	--	--	--

* Millions of dollars (current).

\+ Millions of cubic feet x 1000.

++ Data for years before 1971 not available.

Source: Bureau of Census, Current Industrial Reports, Industrial Gases, 1963-72.

A 5208

BOC RX 190

UNIT VALUE - SHIPMENTS - ACETYLENE

-- Thousands of Dollars/Million Cubic Feet --
(Current Dollars)

Year	Unit Value
1972	13.1
1971	13.3
1970	11.1
1969	10.5
1968	11.9
1967	10.6
1966	10.3
1965	10.1
1964	10.7
1963	10.6

BOC Rx 191

A 5209

SHIPMENTS AND UNIT VALUE - ARGON

Year	Value*	Quantity**	Unit Value (Thousands of Dollars/ Million Cubic Feet - Current Dollars)
1972	33.1	3.8	8.7
1971	29.1	3.0	9.7
1970	39.1	2.7	14.5
1969	38.7	2.6	14.9
1968	33.2	2.1	15.8
1967	25.5	1.9	13.4
1966	26.7	1.7	15.7
1965	22.8	1.3	17.5
1964	20.5	1.0	20.5
1963	18.1	.97	18.7

* Millions of dollars,
** Millions of cubic feet x 1000.

Source: Bureau of Census, Current Industrial Reports, Industrial Gases, 1963-72.

A 5210

Boc Rx 192

SHIPMENTS - CARBON DIOXIDE

Year	Total Value*	Total Quantity**	Method of Distribution: Liquid and Gas Value	Liquid and Gas Quantity	Solid Value	Solid Quantity
1972	39.2	1,371	23.4	1,065	15.8	307
1971	39.0	1,235	21.4	921	17.6	315
1970	37.1	1,028	19.5	711	17.7	318
1969	40.6	1,079	20.9	715	19.7	365
1968	41.8	943	22.5	575	19.3	368
1967	47.4	972	29.4	619	18.0	352
1966	50.2	948	31.2	586	19.0	362
1965	52.7	972	30.3	555	22.4	417
1964	57.5	899	31.4	497	20.1	403
1963	48.9	878	27.9	463	21.1	415

---

* Millions of dollars.

**Thousands of tons (short).

Source: Bureau of Census, Current Industrial Reports, Industrial Gases, 1963-72.

A 5211

Boc Rx 193

UNIT VALUE - SHIPMENTS - CARBON DIOXIDE
(Dollars per Ton - Current Dollars)

Year	Total	Liquid and Gas	Solid
1972	28.6	22.0	51.5
1971	31.6	23.2	55.9
1970	36.0	27.4	55.7
1969	37.6	29.2	54.0
1968	44.3	39.1	52.4
1967	48.8	47.5	51.1
1966	53.0	53.2	52.5
1965	54.2	54.6	53.7
1964	57.9	63.2	49.9
1963	55.7	60.3	50.8

SHIPMENTS - NITROGEN

Year	Value*	Quantity+	Gas: Method of Distribution: Cylinder and Bulk: Percent of Total Value	Gas: Method of Distribution: Cylinder and Bulk: Percent of Total Quantity	Gas: Method of Distribution: Pipeline: Percent of Total Value	Gas: Method of Distribution: Pipeline: Percent of Total Quantity	Liquid: Method of Distribution: Cylinder and Bulk: Percent of Total Value	Liquid: Method of Distribution: Cylinder and Bulk: Percent of Total Quantity	Liquid: Method of Distribution: Pipeline: Percent of Total Value	Liquid: Method of Distribution: Pipeline: Percent of Total Quantity
1972	130.6	176.8	2.4	0.4	23.4	63.4	70.6	33.3	3.6	2.9
1971	128.1	153.8	1.9	0.4	22.1	62.2	72.7	34.6	3.3	2.8
1970	123.0	134.9	3.7	0.5	20.7	60.3	75.6	39.2	—	—
1969	118.6	118.3	3.3	0.5	19.5	59.3	77.2	40.2	—	—
1968	114.8	105.4	4.1	0.7	16.6	57.1	79.3	42.1	—	—
1967	99.6	91.9	5.3	0.8	20.0	56.9	74.8	42.3	—	—
1966	80.6	78.7	[illegible]	1.2	27.4	58.6	64.4	40.1	—	—
1965	69.2	65.3	10.3	1.5	25.4	57.0	64.2	41.5	—	—
1964	48.1	51.3	14.3	1.9	17.2	56.3	68.5	41.7	—	—
1963	40.0	44.0	18.5	2.5	15.8	60.2	65.7	37.3	—	—

*Millions of dollars (current dollars).

+Billions of cubic feet.

Source: Bureau of Census, Current Industrial Reports, Industrial Gases, 1963-72.

A 5212
BOC RX 194

A 5213

Boc Rx 195

SHIPMENTS AND UNIT VALUE - HYDROGEN

Year	Value*	Quantity**	Unit Value (Thousands of Dollars/ Million Cubic Feet - Current Dollars)
1972	30.3	17.9	1.7
1971	31.7	17.5	1.8
1970	35.4	20.9	1.7
1969	38.1	25.5	1.5
1968	37.8	28.3	1.3
1967	39.1	27.7	1.4
1966	42.1	27.8	1.5
1965	38.4	26.0	1.5
1964	35.8	23.5	1.5
1963	25.7	19.9	1.3

* Millions of dollars.

** Millions of cubic feet x 1000.

Source: Bureau of Census, Current Industrial Reports, Industrial Gases, 1963-72.

Boc RX 176

A 5214

UNIT VALUE - SHIPMENTS - NITROGEN

--- Thousands of Dollars / Million Cubic Feet ---
(Current Dollars)

Year	Total	Gas		Liquid	
		Cylinder and Bulk	Pipeline	Cylinder and Bulk	Pipeline
1972	0.74	4.0	0.27	1.6	0.92
1971	0.83	3.8	0.30	1.8	1.0
1970	0.91	6.9	0.31	1.8	—
1969	1.0	6.4	0.33	1.9	—
1968	1.1	5.7	0.32	2.1	—
1967	1.1	7.0	0.38	1.9	—
1966	1.0	6.9	0.48	1.6	—
1965	1.1	7.4	0.47	1.6	—
1964	0.93	6.9	0.29	1.5	—
1963	0.91	6.7	0.24	1.6	—

A 5215

BOC Rx 197

SHIPMENTS AND UNIT VALUE - NITROUS OXIDE

Year	Value*	Quantity**	Unit Value (Thousands of Dollars/ Million Gallons)
1972	4.5	1.3	3.5
1971	4.1	1.1	3.7
1970	3.9	1.1	3.5
1969	3.9	1.0	3.9
1968	3.9	.99	3.9
1967	4.4	.95	4.6
1966	4.6	.93	4.9
1965	4.1	.86	4.8
1964	4.5	.78	5.8
1963	4.8	.73	6.6

* Millions of dollars.
** Billions of gallons.

Source: Bureau of Census, Current Industrial Reports, Industrial Gases, 1963-72.

Boc Rx 198

A5216

SHIPMENTS - OXYGEN

Year	Total		Gas				Liquid			
			Method of Distribution				Method of Distribution			
			Cylinder and Bulk		Pipeline		Cylinder and Bulk		Pipeline	
			Percent of Total		Percent of Total		Percent of Total		Percent of Total	
	Value*	Quantity+	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity
1972	216.8	301.8	1.8	0.2	54.9	81.8	37.5	14.5	5.8	3.5
1971	226.2	268.9	1.9	0.2	47.5	81.1	42.2	18.8	8.4	0.7
1970	237.7	273.5	4.4	1.0	46.6	80.9	49.0	18.1	--	--
1969	229.4	264.9	5.0	1.2	43.4	80.5	51.6	18.3	--	--
1968	224.9	238.4	5.1	1.7	40.4	79.3	54.5	19.0	--	--
1967	208.8	220.8	7.8	1.8	44.2	79.2	48.0	19.0	--	--
1966	173.8	202.4	11.5	2.1	49.9	76.6	38.6	21.3	--	--
1965	172.5	172.4	13.5	2.3	43.0	74.4	43.5	23.3	--	--
1964	157.3	148.2	16.0	2.7	47.2	73.6	36.8	23.7	--	--
1963	136.4	119.0	21.3	4.1	44.1	71.5	34.6	24.5	--	--

* Millions of dollars (current dollars).

+ Billions of cubic feet.

Source: Bureau of Census, Current Industrial Reports, Industrial Gases, 1963-72.

A 5217

BOC Rx 199
(current)

UNIT VALUE - SHIPMENTS - OXYGEN

Year	Total	Gas		Liquid	
		Cylinder and Bulk	Pipeline	Cylinder and Bulk	Pipeline
	--- Thousands of Dollars/Million Cubic Feet --- (Current Dollars)				
1972	0.72	8.1	0.48	1.8	1.2
1971	0.84	8.6	0.49	2.4	2.0
1970	0.87	3.5	0.50	2.4	--
1969	0.87	3.5	0.47	2.4	--
1968	0.94	2.9	0.48	2.7	
1967	0.94	4.2	0.52	2.4	
1966	0.86	4.7	0.56	1.6	
1965	1.0	6.0	0.58	1.9	
1964	1.1	6.3	0.68	1.6	
1963	1.1	5.9	0.70	1.6	

A 5218

BOC RX 200

INHALATION ANESTHETIC EQUIPMENT

Top 8
- AIRCO (Ohio Medical)
- Air Products and Chemicals
- BOC (Fraser-Sweatman, Harris-Lake)
- Bird
- Isolette-Air Shield
- Dupaco
- Portex
- Rusch

Others
- C.R. Bard
- Chemetron
- Respiratory Care
- Medical & Industrial Equipment
- Porter

INHALATION THERAPY EQUIPMENT

Top 8
- Puritan-Bennett
- AIRCO (Ohio Medical)
- Bird
- Hudson
- Monaghan
- BardParker
- Air Shield-Isolette
- C.R. Bard

Others
- Portex
- Oxyequip
- Dupaco
- Abbott
- Air Products & Chemicals
- Chemetron
- 3M
- Mistogen
- Bethlehem Corp
- Davol
- Devilbiss
- Respiratory Care
- Dryden
- BOC (Harris-Lake)
- [redacted]
- American Hospital Supply
- OEM

MEDICAL PIPING SYSTEMS

- AIRCO (Ohio Medical)
- Chemetron (National Cylinder Gas)
- Air Products & Chemicals
- Puritan-Bennett
- Oxyequip

A 5219 BOC Rx 206-A

Report on Visit

CARPENTER TECHNOLOGY CORPORATION

Reading, Pennsylvania, USA

(215) 372-4511

Date: June 1, 1970

By: J. A. Perham
A. Muller

Interviewed: Basil T. Lanphier - Group Vice President Technology and Divisional Operations

Thomas J. Stanton - Vice President Corporate Development

As an opening, explained BOC's interest in helium and approximate UK volume -- our market influence throughout Commonwealth countries -- our association with L'Air Liquide and Gulf Oil in Canadian Helium -- the competition with Air Products in the UK -- why we could be interested in liquid helium which depends on the price of liquid f. o. b. UK or Europe.

Mr. Lanphier then told us that Carpenter Technology (formerly Carpenter Steel) had acquired Gardner Cryogenics on August 1, 1969. The total consideration was $12-million in convertible preferred shares. The initial payment was $3-million and the remainder to be paid by installments according to sales and profit performance over a five-year period. Mr. Stanton said the deal was worth about $9 1/2-million discounted to present day. Bill Gardner ran the Gardner Cryogenics Division until March 1, 1970, when Carpenter asserted themselves and took over the management.

Carpenter are suing Bill Gardner for the return of some of the shares on the basis of misrepresentation at the time of sale. During September to December 1969 Bill Gardner had discussions with Mr. André Lot of L'Air Liquide for the disposal of the Brussels depot and European sales. The litigation does not preclude the sale of European operations because it will not be to the detriment of the original shareholders of Gardner Cryogenics and because Bill Gardner had started this action before his precipitous departure.

Any deal affecting the USA operations of Gardner Cryogenics will probably have to wait the outcome of the litigation.

Mr. Lanphier said that three companies have shown a real interest in the European operation. He confirmed L'Air Liquide and Multigas (G. L. Loos). We suspect the third could be AGA. However, Al Muller has some reason to believe it could be Union Carbide.

BOC RX 206-B

A 5220

Report on Visit - Carpenter Technology Corporation

Carpenter are prepared to turn the European sales over in exchange for a firm price per 1000 c.f. of liquid helium on an annual take-or-pay basis starting at 15-million c.f. the first year and rising to 30-million c.f. the fifth year. The contract period would be for fifteen years with the price firm for seven years. After seven years if a new price is not agreed the contract could be cancelled. They are aware of the possibility of Algerian helium and feel seven years is realistic.

They are presently in the final stage of contract negotiations with an unnamed party which we assume to be Multigas. They did not consider it ethical to reveal the price but said it is between $45 and $55 per 1000 c.f. for liquid helium f.o.b. Brussels. Mr. Lanphier expects the contract will be agreed within the next two weeks by the other party and, if so, Carpenter will sign.

L' Air Liquide made an offer of $45 per 1000 c.f. and a six-year contract which Carpenter considered "auctioning" and refused.

Whoever secures this business will be expected to take over the Brussels depot at essentially book value of about $270,000. Unfortunately we are not clear if Gardner-Europe owns the land and building. The plant consists of a transfilling station, a reliquefier and a purifier. They have some leased cylinders for gaseous distribution. These leases will be assumed by the purchaser. There are 13 hourly-paid employees in the plant, plus 5 salaried employees.

All equipment for trans-Atlantic delivery of liquid will remain with Carpenter. Delivery will be made from Heightstown, N.Y. They have 3x8000-gallon liquid trailers in service plus some 4 to 6 1000-gallon containers for emergency shipment by air. They will require a 30-day turn around time on the liquid trailers.

Present sales in Europe are entirely wholesale to some 12 customers amounting to just over 15-million c.f. per year partly as liquid. During April 1970 liquid sales were 12000 litres. Lanphier said G.L. Loos has been the largest customer and he also mentioned L' Air Liquide, Griesheim and AGA. German Linde are not customers (I believe they buy from Airco). There are no long-term contracts but Stanton believes they all have one-year notice of cancellation. The current average selling price to European customers is $94.32 per 1000 c.f. This varies slightly according to the liquid-gas mix.

Mr. Lanphier apologized for their lack of knowledge of the Brussels plant which they have never seen. He has only been responsible for this business about two months.

A 5221

BOC RX 206-C

Report on Visit - Carpenter Technology Corporation

Helium product comes from Alamo Chemicals in Greenwood, Kansas. Alamo Chemicals is a wholly-owned subsidiary of Phillips Petroleum. All helium liquefaction and distribution is a 50/50 joint venture of Alamo Chemicals and Gardner Cryogenics. Alamo capacity is 140-million c.f. per year with a liquefier capable of liquefying 40%. Liquefying capacity is now being increased to 80%.

Gardner Cryogenic hardware sales in 1969 were just over $1-million and sales for 1970 will be about the same. Most of these sales have been one or two large contracts in each year. The hydrogen recovery plant for Humble Oil was mentioned. They could be interested in exploring a joint venture with Cryoproducts. They are definitely not interested in any exchange of technology. They prefer an equity position.

We discussed the possibility of a joint arrangement on metals. This could be most interesting and should be explored separately. They asked if we would send them some Murex catalogues.

We also explored the possibility of a joint venture in the USA via a BOC position in Gardner Cryogenics. This could also be of interest and need not conflict with the European question.

The present urgency is because if Multigas (or whoever) come back within the agreed two weeks Carpenter will sign unless another agreement is available. If we are interested we must come up with an agreement in principle.

In my opinion, we should consult L. A. L. -- advise them of the present urgency -- and if we agree have a BOC/LAL agreement to take over Gardner-Europe.

I told Mr. Lanphier we would give him a reply one way or another within two weeks.

June 1, 1970
J. A. Perham

copies to: L. E. Smith (3)
A. Muller

PS -Attached is a set of notes prepared in advance of the discussions and used as a guide.

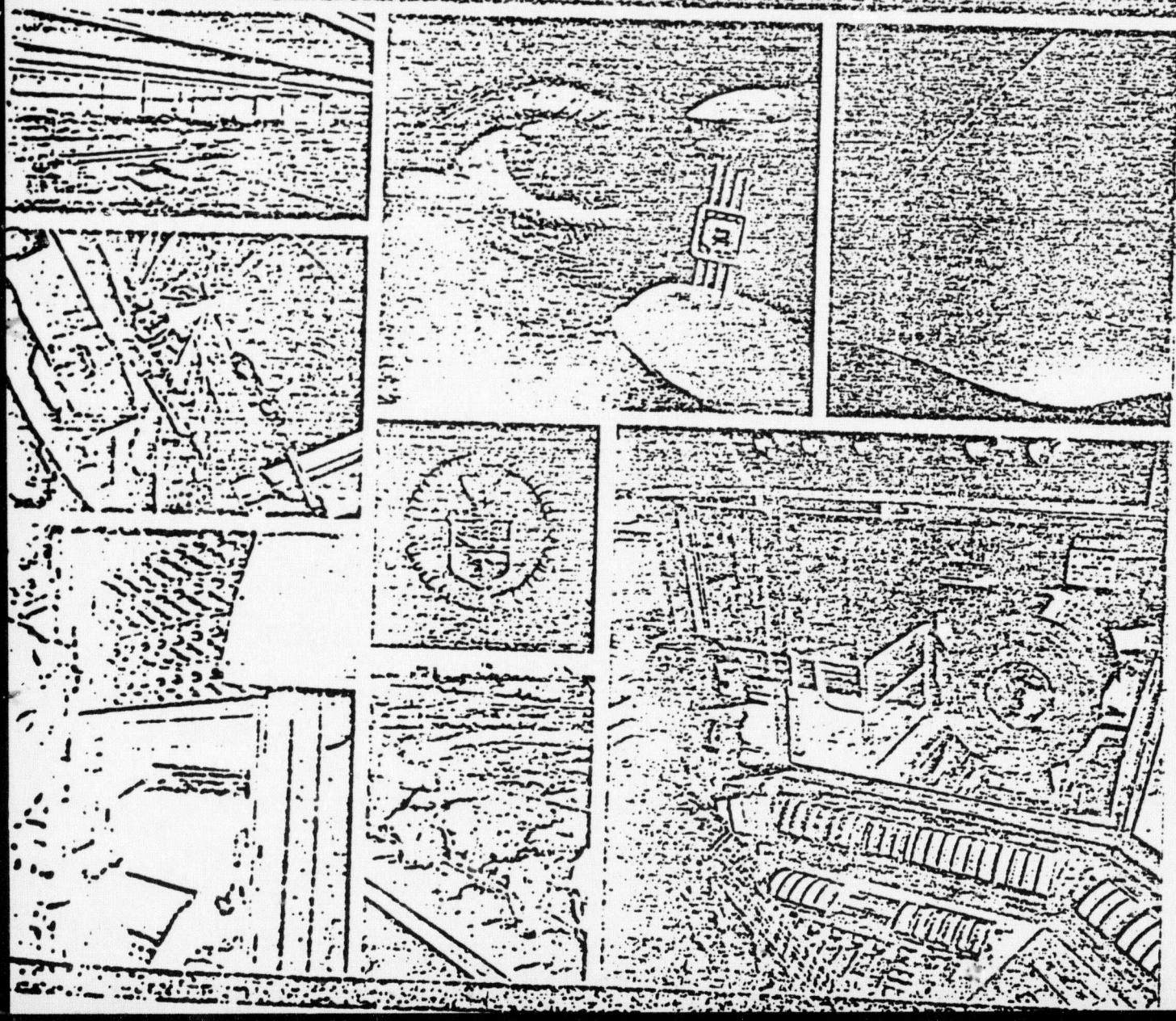
A 5222

BOC Rx 208-A

U.S. DEPARTMENT OF COMMERCE
Domestic and International Business Administration

U.S. Industrial Outlook 1974

With projections to 1980



Boc Rx 208-B

A 5223

1973 Profile

Industrial Gases

SIC code	2813
Value of industry shipments (millions).	$750
Number of establishments	507
Total employment (thousands)	9
Compound annual average rate of growth 1967–73 (percent):	
Value of shipments (current dollars).	4.1
Employment	−1.7
Major producing areas	North Central, South Atlantic, and West

Outlook for 1980

The chlor-alkali industry's long range prospects continue to be favorable. Projected value of shipments of the industry place 1980 shipments at $1 billion, a growth rate of about 4.4 percent for the period 1971–1980. While production and use of chlorine and caustic soda is expected to grow at 6 to 7 percent through 1980, synthetic soda ash is expected to decline gradually. There will be a growth of 8 to 9 percent from mined or brine sources, or an over-all product gain of 4 to 5 percent for soda ash.

Use rates for most chlor-alkalies continue upward although more firms build on-site plants when their needs warrant. Natural or mined soda ash, most of which is shipped, will grow rapidly. The major problem of the industry continues to be availability and cost of electric power.

Many Uses For Industrial Gases

Value of industry shipments has shown slow growth, because an increasing quantity of gases is being produced captively.

Significant differences in growth rates, are found in the production figures for industrial gases. The largest gainer continues to be argon, with nitrogen and oxygen production also increasing at rapid rates.

Acetylene and hydrogen production are dropping while carbon dioxide production (liquid, gas and solid) is growing slowly. There have been several announcements of experimental programs in the use of oxygen to curb the eutrophication of lakes by companies and municipalities. This could be a major new use of oxygen in the future.

The major use of oxygen is in steel production and high output of steel has insured a high 1973 production figure.

Food freezing and food transportation continue to be the major uses of nitrogen, displacing carbon dioxide to some extent for these uses.

Industrial Gases: Trends and Projections 1967–74

[In millions of dollars except as noted]

	1967	1968	1969	1970	1971	1972 [1]	1973 [1]	Percent increase 1972–73	1974 [1]	Percent increase 1973–74
Industry [2]										
Value of shipments	588.7	668.3	696.8	716.1	665.3	700	750	7	795	6
Total employment (thousands)	10.3	9.9	9.5	9.6	9.1	9.3	9.3	--	--	--
Production workers (thousands)	5.3	5.0	5.0	5.1	4.9	5.0	5.0	--	--	--
Value added	401.9	493.2	500	517.9	479.0	--	--	--	--	--
Value added per production worker man-hour ($)	36.12	47.00	47.63	48.75	47.85	--	--	--	--	--
Production										
Carbon dioxide (thousand s-tons)	1,059	1,058	1,167	1,135	1,270	1,444	1,500	--	--	--
Acetylene (million cu. ft.)	14,269	15,071	15,819	14,834	12,336	11,457	11,000	--	--	--
Nitrogen (million cu. ft.)	103,933	116,721	132,691	151,191	165,219	185,351	212,000	--	--	--
Oxygen (million cu. ft.)	225	238	276	284	319	352	390	--	--	--
Argon (million cu. ft.)	1,912	2,114	2,507	2,742	3,009	3,753	4,050	--	--	--
Hydrogen (million cu. ft.)	158,539	201,752	61,521	59,151	55,630	58,043	54,000	--	--	--

[1] Estimated by Bureau of Competitive Assessment and Business Policy (BCABP).

[2] Value of all products and services sold by the industrial group (SIC 2813).

[3] Value of shipments of industrial gases made by all industries.

Source: Bureau of the Census, Bureau of Labor Statistics, BCABP.

BOC RX 222-A

Sent to Overseas Companies February 1973

A 5224

CONSULTATION - BOC - OVERSEAS COMPANIES

What follows should be read in conjunction with the paper "Overseas Company Boards" of 21 July 1972. Having set out our view of the role of Boards in control and direction, we now consider it appropriate to restate the principles which should be followed in considering the need for consultation with BOC over the direction and management of the Overseas Companies.

Much has changed since this matter was last referred to in the document 'International Organization' dated 2.7.68, which was circulated to all Overseas Chairmen and Managing Directors.

Communications have improved, the companies have grown substantially and there has been a change in the method of consultation: there is now much more face-to-face relaxed discussion, more use of telephone and telex, and altogether more speed and informality. There has also been a change in emphasis regarding matters on which BOC expects to be consulted. This is now less on day-to-day management matters or individual items of capital expenditure (even of a major nature as long as they are within the framework of the traditional business of the company and unless BOC financial support is required) and more on strategic questions (usually financial, organizational or business/resource - development). As decisions of this type do not usually have to be taken against a tight deadline, there should not usually be a problem about finding time for consultation, especially if it is thought about early enough.

Presupposing an effective Board which BOC can regard as its custodian, there is no need or desire to change the principle on which we have been working since the mid 1960s - ie minimum control from London, but maximum opportunity to be taken for consultation, wherever Group experience - whether in UK or Overseas - should or may be able to help solve a problem or exploit an opportunity better than action following a decision taken in isolation.

Bearing in mind the above, the following are typical of matters on which BOC expects to be consulted before commitment -

A BOARD

Changes in Board membership and directors' fees.

Changes in position or remuneration of executive directors.

B FINANCIAL

Alteration in authorised or issued share capital, debenture capital, debenture deeds.

B FINANCIAL (continued)

Allocation of profits to reserve, dividend payments, other disposal of ascertained trading profits.

Revaluation of assets.

Proposals for share option or other profit sharing schemes.

C OPERATIONAL

New developments taking the company into a new business or a new country, whether by acquisition or otherwise.

Any other significant acquisition proposal, eg buying a competitor or a competitor's major distributor/agent.

Any proposal which may involve the use of shares.

Any investment involving BOC financial support, direct or indirect (eg helping with offshore borrowing).

Any major tonnage supply offer involving competitive bidding.

Any major question of policy in relation to one of our international competitors.

Any agreement or selling agency with international implications or which might affect the interests of other Group companies.

Major reorganizations of management structure.

Disinvestment out of any major or well-established business area.

Senior appointments (normally at the level reporting direct to the Managing Director or equivalent).

Exports - developments of new markets which may have impact on other Group companies.

D LEGAL AND INSURANCE

Major litigation or arbitration proceedings.

Alterations to Memoranda and Articles of Association.

BOC RX 222-C

D LEGAL AND INSURANCE (continued)

Major items of policy on company insurance (eg extent of uncovered risks, placements to obtain optimum premiums).

All the above refer to consultation with the corporate centre. Category A and some of Category B contain matters which will normally be raised by or with the overseas Chairman concerned. Otherwise, we would expect initial communication to be between the Managing Director overseas and Chairman and MD(RCH-J) BOC or Head Overseas Services as appropriate.

There are other matters in which we are actively trying to encourage consultation directly between operating units. Notably -

R & D programmes. To avoid unnecessary duplication and, even more important, to arrive at products with global appeal and saleability.

Development of marketing policies, particularly for products which are sold internationally.

Manufacturing plant - major new investment. To ensure selection of the best equipment for eg electrode production. To ensure a co-ordinated approach to increases in capacity to meet international requirements.

The support of top management overseas in helping to promote this closer working, which has the full backing of BOC International, will be appreciated.

Sent to Overseas Companies 21 July 1972

BOC RX223-A

A 5227

OVERSEAS COMPANY BOARDS

Decentralised management, with all operating decisions being taken locally within the framework of an operating budget for the year and a rolling 5 year plan, agreed with BOC, is a fundamental principle of BOC Group policy. It is the responsibility of the chief executive of each operating unit to ensure that all major decisions are in harmony with BOC Group policy and strategy.

Within these limits, the chief executive of an overseas company is responsible to the Chairman and Board of Directors of his company for the performance of his company -

> to maximise long-term growth and profitability for the shareholders,
>
> to provide a working environment, career opportunities and job satisfaction appropriate to an enlightened, progressive employer in that country,
>
> to behave as a responsible corporate member of the industrial community in that country.

In these circumstances, BOC places emphasis on the need for strong Overseas Company Boards, consisting predominantly of non-executive directors which can, from the strength of their composite local experience, counsel and guide the chief executive in the pursuit of those objectives, assume final responsibility for the strategy chosen to achieve them, and monitor the performance of the management in its execution.

It is appropriate to explain in somewhat more detail the role which BOC as the sole or principal shareholder expects the Overseas Company Board to fulfil in the development and control of their company.

It is easy to define what we do not expect. We do not wish the Board to manage the company. Not so easy is to explain in positive terms where the Board fits in between local executive control and BOC final sanction. But, given a proper understanding of some guidelines, this may not be important.

We believe the Board should, with BOC participation wherever relevant (particularly in relation to paragraphs 1 - 3) -

1 Ensure that long-term objectives for the company are established and take final responsibility for them. While boards have traditionally concentrated on the provision of the financial resources

to enable the agreed strategy to be implemented, we believe that they should recognize that even more vital is the need to plan for and develop adequate human resources.

2 Recommend and take final responsibility for the appointment of the chief executive.

3 Take formal decisions on matters reserved to the Board by the Articles of Association, eg payment of dividends, appointments to the Board (after consultation with BOC), disposal of corporate assets, or on matters that the Board at its own discretion decides not to delegate, eg capital expenditure above certain limits.

4 Ensure that information reaching it is comprehensive in covering all important aspects of what management is doing, how it is being done and the results.

5 Regularly review all aspects of company performance, eg competitive status, market share, profitability and growth prospects of the companies separate businesses or product groups; cash flow management, investment profitability (performance against forecast at time of approval); effectiveness of management development programmes, employee relations, the company's reputation with its various publics (public relations), relationship with the financial community.

6 Stimulate and encourage management by a continuous commentary of advice, question and review.

If we are agreed on the above, then several points arise -

A <u>EMPHASIS ON THE FUTURE</u>

It is easy for Boards to become over-involved in the examination and discussion of historical performance reports, routine management reports of relative insignificance, and the study of routine detail. In our view, Boards should resist this trend and consciously devote more of their time to understanding and questioning management's thinking and action on the immediate and mid-term future, particularly in relation to -

(i) The effective use of financial resources - to build on strengths not reinforce weakness - including proper examination of major capital projects brought forward for approval and

BOC RX 223-C

A EMPHASIS ON THE FUTURE (continued)

periodic review of actual performance of previously approved projects against original estimates.

(ii) The effective use of human resources - management development, training, succession, organization development, motivation. Adequacy of top and middle management strengths.

(iii) The concentration of effort on profitable and growth areas of the business.

(iv) The identification of business areas which, because of lack of profitability or significance to the company's overall future, might be divested.

This, in turn, shapes the information which should come to the Board.

B INFORMATION FOR THE BOARD

The contribution which can be expected from outside directors is largely dependent on the relevance, adequacy and timeliness of this information, although it should be supplemented by discussion and visits to company operations from time to time. The written information coming to Boards must give individual directors the opportunity to brief themselves in accordance with the responsibilities outlined above, and to have an understanding of the underlying health of the company's various businesses and the present and likely future competitive environment in which they operate.

C BOARD AGENDAS

Agendas should be formulated to cause the information referred to above to come to Boards, including periodic (often only annual) reviews of certain subjects, eg -

(i) Assessment of and outlook for (and strengths and weaknesses of) each of the company's major businesses.

(ii) Reappraisal of company objectives and strategies, including consideration of possible areas for diversification or divestment.

(iii) Review of estimated results for the current year and implications of these for management priorities.

BOC RA 223-D

C BOARD AGENDAS (continued)

(iv) Presentation and discussion of specific studies arising out of long-term strategy and competitive, economic or political trends.

(v) Review of management development and succession plans.

In some of these, participation by BOC representatives on the Board will be desirable, so that Group policy and implications can be clearly understood. It should be possible to organize the timing of these items some months in advance, so that appropriate BOC attendance can be organized well ahead, thus placing a clear obligation on BOC to provide the necessary background information and support.

D SELECTION OF NON-EXECUTIVE DIRECTORS

If non-executive directors are to fulfil these functions, much thought needs to be given at the time of their selection not only to their experience and qualifications, but also the time they will have available to devote to their Board responsibilities. Also, the fees paid to directors must be commensurate with the contribution expected from them as described above.

RCHJ/AC
21.7.72

A 5231

BOOK # 228

asa

AMERICAN SOCIETY OF ANESTHESIOLOGISTS ANNUAL MEETING
SAN FRANCISCO HILTON AND CIVIC AUDITORIUM-BROOKS HALL COMPLEX
SAN FRANCISCO, CALIFORNIA
OCTOBER 7-11, 1973

1973 ANNUAL MEETING PROGRAM

A 5232 BOC RX 228.B

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Acute Care Workshop	55
Education Workshop	29
Management Workshop	47
Respiratory Therapy Workshop	35
Review of Anesthesiology Devices	45
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Boc RX 228 2-60

Tuesday-Wednesday-Thursday, October 9-11

Tuesday-Wednesday, 8:30 a.m. to 5:00 p.m.
Thursday, 8:30 a.m. to 2:00 p.m.
Brooks Hall

1973 Technical Exhibitors

Listed Alphabetically

Exhibitor	Booth Number
Abbott Laboratories	19-20
Abbott Medical Electronics Company	9-10
Air Products and Chemicals, Inc.	71-72-73
Air-Shields, Inc.	112-113
Aloe Medical	37
American Hospital Supply	138-139
American Optical Corporation	39
Anesthesia Associates, Inc.	64
Arbrook, Inc.	95-96
Arnar-Stone Laboratories, Inc.	193
Astra Pharmaceutical Products	70
Automation Industries, Inc.	110-111
Ayerst Laboratories	13-14
C. R. Bard, Inc.	79
Bard-Parker Company	62-63
Beckman Instruments, Inc.	68
Becton-Dickinson	65
Bentley Laboratories, Inc.	54
Bird Corporation	1-2
Boehringer Laboratories, Inc.	22
Bourns Life Systems	125
Breon Laboratories	107
British Oxygen Company Ltd.	184-185-186

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A 5234 BOC RX 2282-61

Technical Exhibitors, cont'd.

Exhibitor	Booth Number
The Burdick Corporation	159
Burroughs Wellcome Company	28
Cal-Med Electronics Company	207
Cardio-Pulmonary Instruments Corporation	53
Cavitron Hospital Division	90
Chemetron Corporation	176-177
Cincinnati Sub-Zero Products, Inc.	89
Concept, Inc.	93
Cutter Laboratories, Inc.	49
Datascope Corporation	134-135
F. A. Davis Company	94
Davol	55-56
Deseret Pharmaceutical Company, Inc.	85
The DeVilbiss Company	168
Dover Products	153
Dryden Corporation	27
Dupaco, Inc.	118-119
Electronics for Medicine, Inc.	144-145
J. H. Emerson Company	99
Eschmann U.S.A., Inc.	157
Extracorporeal Medical Specialties, Inc.	11-12
Fenwal Laboratories	74
Fraser Sweatman, Inc.	29-30
General Electric Company	75-76-77
GFM Medical People	59-60
W. R. Grace & Company	101
Grumman Health Systems	198-199
Harris-Lake, Inc.	126-127
Healthdyne, Inc.	4
Hewlett-Packard Company	141-142-143

A 5235 BOC RX 228-2-62

Technical Exhibitors, cont'd.

Exhibitor	Booth Number
Illinois Tool Works, Inc.	130
Instrumentation Laboratory, Inc.	87-88
Instrumentation for Medicine, Inc.	23
Jelco Laboratories	151
The Jobst Institute, Inc.	24
Laerdal Medical Corporation	61
Leyland Medical Products	163
J. B. Lippincott Company	6
Liquid Carbonic Corporation	122
Little, Brown and Company	183
LKB Medical Inc.	17
The London Company	80
Marion Laboratories, Inc.	7
McGaw Laboratories	140
McNeil Laboratories, Inc.	128-129
Medical & Industrial Equipment Ltd.	164-165
Medical Plastics, Inc.	66
Medical Systems Corporation	156
Medinique International, Inc.	97-98
Mediscience Technology Corporation	120
Medsonics, Inc.	84
Micron Instruments, Inc.	92
Mistogen Equipment Company	100
3M Company	67
The Monaghan Company	102
The C. V. Mosby Company	69
North American Drager	50-51
OEM Medical	158
Ohio Medical Products	43-44-45-46-47-48

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BOC RX 228-2-6

Technical Exhibitors, cont'd.

Exhibitor	Booth Number
Olympic Surgical Company	123-124
O'Neal, Jones & Feldman, Inc.	155
Organon, Inc.	117
O-R Products Company, Inc.	152
Pall Corporation	83
Parke, Davis & Company	174-175
Parks Electronics Laboratory	18
Pennwalt Prescription Products	5
Perkin-Elmer Corporation	3
Pfizer Laboratories	57
Pharmacia Laboratories, Inc.	58
Pharmaseal	131-132
Portex Ltd.	188-189-190-191
Puritan-Bennett Corporation	103-104-105-106
Ramtech, Inc.	116
Reid & Sigrist Ltd.	187
Respiratory Care, Inc.	8
Roche Laboratories	170-171-172-173
Roche Medical Electronics	81
Roerig Division, Pfizer, Inc.	15
Royale Laboratory	109
Rusch, Incorporated	21
Hugo Sachs Elektronik KG	91
W. B. Saunders Company	38
Scientific Research Instruments Corp.	31
G. D. Searle & Company	32-33-34-35
Sherwood Medical Industries, Inc.	86
Shiley Laboratories, Inc.	52
Sierracin Corporation	133
Sorenson Research Company	115

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BOC RX 228-2-64

Technical Exhibitors, cont'd.

Exhibitor	Booth Number
Systems Research Laboratories, Inc.	150
Charles C. Thomas, Publisher	160
Travenol Laboratories, Inc.	40-41-42
The Upjohn Company	108
Valleylab, Inc.	146
Veriflo Corporation	121
Vernitron Medical Products, Inc.	114
Video Digest, Inc.	137
Vitalograph Ltd.	161-162
Warne Surgical Products Ltd.	166-167
Williams & Wilkins Company	136
Winthrop Laboratories	78
Wyeth Laboratories	36

A 5238

Boc RX 22P-C-W

Tuesday-Wednesday-Thursday, October 9-11

Tuesday-Wednesday, 8:30 a.m. to 5:00 p.m.
Thursday, 8:30 a.m. to 2:00 p.m.
Brooks Hall

1973 Technical Exhibitors

Bird Corporation — **Spaces 1-2**
Palm Springs, California
Medical equipment, Respiratory Ventilators

Perkin-Elmer Corporation — **Space 3**
Pomona, California
Medical Gas Analyzer, Model MGA-1100. Measures the composition of inspired and expired gas to aid in the monitoring of pulmonary and cardiovascular parameters in clinical and research applications.

Healthdyne, Inc. — **Space 4**
Smyrna, Georgia
Respiratory function monitor, inspired air thermometer, respiratory support equipment, pulse monitor

Pennwalt Prescription Products — **Space 5**
Rochester, New York
Nesacaine* (chloroprocaine HC1) local anesthesia and NESACAINE-CE (chloroprocaine HC1) Caudal and Epidural

J. B. Lippincott Company — **Space 6**
Philadelphia, Pennsylvania
Books and journals

Marion Laboratories, Inc. — **Space 7**
Kansas City, Missouri
Spirostat

Respiratory Care, Inc. — **Space 8**
Arlington Heights, Illinois
Bain breathing circuit

Abbott Medical Electronics Co. — **Spaces 9-10**
North Chicago, Illinois
Patient monitoring systems, including both Hardwire and Telemetry instrumentation. "ABBOGRAPH" patient trend recorder for automated anesthesia record-keeping. "ABBY" portable non-fade cardioscope

Extracorporeal Medical Specialties, Inc. — **Spaces 11-12**
King of Prussia, Pennsylvania
Lanz tracheostomy tubes and endotracheal tubes, Swank blood filter for transfusion of stored blood and the Holter infusion pumps

A 5239

BOC RX 228-2-66

Technical Exhibitors, cont'd.

Ayerst Laboratories — **Spaces 13-14**
New York, New York
FLUOTHANE*, INDERAL*

Roerig Division, Pfizer, Inc. — **Space 15**
New York, New York

LKB Medical, Inc. — **Space 17**
Rockville, Maryland
Engstrom respirator

Parks Electronics Lab. — **Space 18**
Beaverton, Oregon
Doppler ultrasound blood flow detectors

Abbott Laboratories — **Spaces 19-20**
North Chicago, Illinois
Penthrane, New Regional Anesthesia Trays

Rusch, Incorporated — **Space 21**
New York, New York
Tracheal tubes and other devices

Boehringer Laboratories, Inc. — **Space 22**
Wynnewood, Pennsylvania
Positive displacement spirometer, PEEP valves, inspiratory force meter, Post operative exerciser, precision air sampling system

Instrumentation for Medicine, Inc. — **Space 23**
Greenwich, Connecticut
IfM/Minnesota Impedance cardiograph and accessories

The Jobst Institute, Inc. — **Space 24**
Toledo, Ohio
Anti-embolism elastic stockings, hydro-float flotation products

Dryden Corporation — **Space 27**
Indianapolis, Indiana
Disposable anesthesia circle complete with mask and other anesthesia accessories

Burroughs Wellcome Co. — **Space 28**
Research Triangle Park, North Carolina
Anectine and Neosporin Ointment

Fraser Sweatman, Inc. — **Spaces 29-30**
Lancaster, New York
Quantiflex Rigid Frame, MDM Compact Anesthesia Apparatus and Accessories, Fluotec, Pentec and Enfluratec Vaporizers and the Quantiflex MDM Mixer.

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A 5240 BOC RX 228-2-67

Technical Exhibitors, cont'd.

Scientific Research Instruments Corp. — **Space 31**
Baltimore, Maryland
Medspect medical mass spectrometer and Medspect Respiratory intensive care monitoring system

G. D. Searle & Company — **Spaces 32-33-34-35**
Chicago, Illinois
Volume ventilator, CPAP infant hood

Wyeth Laboratories — **Space 36**
Philadelphia, Pennsylvania
Largon-phenergan injection, tubex, serax

Aloe Medical — **Space 37**
DIV. SHERWOOD MEDICAL IND., INC.
St. Louis, Missouri
Argyle caths and tubes

W. B. Saunders Company — **Space 38**
Philadelphia, Pennsylvania
Medical books

American Optical Corporation — **Space 39**
Bedford, Massachusetts
Complete line of monitoring, central station and resuscitation equipment

Travenol Laboratories, Inc. — **Spaces 40-41-42**
Deerfield, Illinois
Anesthesia procedure trays, solutions and sets, resuscitation, defibrillation and monitoring equipment

Ohio Medical Products — **Spaces 43-44-45-46-47-48**
Madison, Wisconsin
Medical gases, anesthetic agents, anesthesia apparatus and accessories, ventilators, respirators, pulmonary function testing equipment, gas evacuation system

Cutter Laboratories, Inc. — **Space 49**
Berkeley, California
Anesthesia saftisets, saftipumps, extension sets, specialty items, Para-Bloc trays and kits and Pudendal Bloc Kits

North American Drager — **Spaces 50-51**
Telford, Pennsylvania
NARKOMED Anesthesia Machine, MINUTE-VOLUMETER VAPOR Vaporizer

Shiley Laboratories, Inc. — **Space 52**
Santa Ana, California
Shiley Low Pressure Cuff Tracheostomy Tubes and Endotracheal Tubes

Cardio-Pulmonary Instruments Corp. — **Space 53**
Houston, Texas
Model 5300 Pulmo-Lab, Model 4500 Single Breath DLCO System and Model 1500 Flo-Volume Digitizing System

A 5241 BOC Rx 228-2-68

Technical Exhibitors, cont'd.

Bentley Laboratories, Inc. ..... **Space 54**
Irvine, California
Bentley Polyfilter Blood Filters, ATS Autotransfusion System

Davol ..... **Spaces 55-56**
Providence, Rhode Island
Davol sterile, single-use bronchial aspirating catheters, tracheal suction tray, the Davol/Vickers VENTIMASK, and nasal oxygen cannula, endotracheal tubes, rubber and plastic aspirating catheters, tubing and other anesthesia products

Pfizer Laboratories, Pfizer, Inc. ..... **Space 57**
New York, New York
Vistaril

Pharmacia Laboratories, Inc. ..... **Space 58**
Piscataway, New Jersey
Low Molecular weight dextran, RHEOMACRODEX® (dextran 40), for blood flow improvement and plasma volume expansion

GFM Medical People ..... **Spaces 59-60**
Woburn, Massachusetts
Respiration units and respiration monitors

Laerdal Medical Corporation ..... **Space 61**
Tuckahoe, New York
Resuscitation training aids and emergency medical equipment

Bard-Parker Company ..... **Spaces 62-63**
Fairfield, New Jersey
Conductive anesthesia circuits with rebreather bag, non-conductive circuits, anesthesia filters

Anesthesia Associates, Inc. ..... **Space 64**
Hudson, New York
CO_2 absorber, CO_2 Analyzer, Rahn Sampler, Disposable Plastic "Y's" and Elbows, Wright Respirometers, Wright Peak Flow Meter, and many other anesthesia items

Becton-Dickinson ..... **Space 65**
DIV. OF BECTON, DICKINSON & CO.
Rutherford, New Jersey
Reusable and disposable spinal needles, adapters and tubing. LONG-DWEL Catheter Needles, stopcocks and adapters

Medical Plastics, Inc. ..... **Space 66**
Minnetonka, Minnesota
"EKG-iT" Plate Electrode, Disposable Ground Plates, MON-iT Sentry System

CONTINUED ON NEXT PAGE

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BOC Rx 228-2-69

Technical Exhibitors, cont'd.

3M Company - Medical Products — **Space 67**
St. Paul, Minnesota
Surgical Tapes, Diagnostic Instruments, Surgical Equipment, Anesthesia Circuits

Beckman Instruments, Inc. — **Space 68**
Fullerton, California
LB-2 Medical Gas Analyzer, OM-11 Oxygen Analyzer, Respiratory Recorder

The C. V. Mosby Company — **Space 69**
St. Louis, Missouri
Medical Reference and Text Books

Astra Pharmaceutical Products — **Space 70**
Worcester, Massachusetts
Xylocaine* (lidocaine) and Citanest* (prilocaine) local and topical anesthetics

Air Products and Chemicals, Inc. — **Spaces 71-72-73**
Allentown, Pennsylvania
Foregger Anesthesia Apparatus, Equipment, Disposables, Medical Gases, Suction Control Equipment and Hospital Central Piping Systems

Fenwal Laboratories — **Space 74**
Morton Grove, Illinois
Microaggregate Blood Filter, Automatic Blood Warmer, Blood Delivery Systems

General Electric Company — **Spaces 75-76-77**
Milwaukee, Wisconsin
Monitoring Systems: ECG, ABP, VBP, Resp. Temp, Surgical Monitoring, and Blood Gas Monitoring

Winthrop Laboratories — **Space 78**
New York, New York
Talwin Injectable - Isuprel Shock 1:5000

C. R. Bard, Inc. — **Space 79**
Murray Hill, New Jersey
ADVANSET™ and related IV units

The London Company — **Space 80**
Cleveland, Ohio
Radiometer BMS3 Mark 2 Blood Gas Analyzer, PHM72 Mark 2 direct Read-out, and CMT-10 Chloride Titrator

Roche Medical Electronics Division — **Space 81**
Cranbury, New Jersey
(2) - 2100s and Central Station, (1) 1216 - Arteriosonde; (1) 1508 Recorder

Pall Corporation — **Space 83**
Glen Cove, New York
Blood Transfusion Filter, Oxygenator Filters

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BOC RK 22F-2-70

Technical Exhibitors, cont'd.

Medsonics, Inc. ..... **Space 84**
Mountain View, California
Doppler Ultrasound blood flow equipment, Photoplethysmography finger pulse sensor equipment

Deseret Pharmaceutical Company, Inc. ..... **Space 85**
Sandy, Utah
ANGIOCATH, INTRACATH, E-Z SETS

Sherwood Medical Industries, Inc. ..... **Space 86**
St. Louis, Missouri
Monoject Procedure Kits, Needles and Syringes

Instrumentation Laboratory, Inc. ..... **Spaces 87-88**
Lexington, Massachusetts
Blood Parameter analysis

Cincinnati Sub-Zero Products, Inc. ..... **Space 89**
Cincinnati, Ohio
BLANKETROL Hyper-Hypothermia System, SZ/TK Tele-Thermometer

Cavitron Hospital Division ..... **Space 90**
Englewood Cliffs, New Jersey
Cavitron Halothane and Oxygen Analyzers, Donti Pulmonary Performance Analyzer and Recorder

Hugo Sachs Elektronik KG ..... **Space 91**
Houston, Texas
Visicard 8 Electrocardioscope, Deficard Defibrillator

Micron Instruments, Inc. ..... **Space 92**
Los Angeles, California
Blood flow and blood pressure monitoring equipment

Concept, Inc. ..... **Space 93**
St. Petersburg, Florida
New indirect/direct Laryngoscope, Constalert monitor, Flexible Intubation Light, also Sterile, Disposable Hot Wire Cauteries, Nerve Locator Stimulator, Disposable Penlights, Tongue Depressors and Disposable Tongue Clamp

F. A. Davis Company ..... **Space 94**
Philadelphia, Pennsylvania
Medical Books

Arbrook, Inc. ..... **Spaces 95-96**
Arlington, Texas
CIDEX* Activated Dialdehyde Solution, CIDEMATIC* Decontamination System, S-ENTRY* Contamination Control Dry Mat, SURG-A-TEMP* Temperature Monitoring Instrument, MICRO-TOUCH* Latex Medical Gloves, DISPOS-A-GLOVE* Examination Gloves, ARBROOK* Vinyl Medical Gloves

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A 5244 BOC RX 228-2-71

Technical Exhibitors, cont'd.

Medinique International, Inc. — **Spaces 97-98**
Bala Cynwyd, Pennsylvania
Dameco Intravenous Catheter System

J. H. Emerson Company — **Space 99**
Cambridge, Massachusetts
Volume Ventilators and other respiratory equipment

Mistogen Equipment Company — **Space 100**
Oakland, California
Respiratory Therapy Equipment

W. R. Grace & Company — **Space 101**
DEWEY & ALMY CHEMICAL DIVISION
Cambridge, Massachusetts
SODASORB® CO_2 Absorbent

Monaghan — **Space 102**
DIV. OF SANDOZ-WANDER, INC.
Littleton, Colorado
Model 300 anesthesia ventilator, Model 700 ventilation monitor, Model 675 ultrasonic nebulizer, Model 690 ultrasonic nebulizer, Model 225 ventilator, and neoprene accessories

Puritan-Bennett Corporation — **Spaces 103-104-105-106**
Kansas City, Missouri
Respiratory Therapy Units

Breon Laboratories — **Space 107**
New York, New York
Bronkometer-2, Bronkosol-2, Bronkotabs, Bronkolixir, Fergon, Bronkephrine, Measurin

The Upjohn Company — **Space 108**
Kalamazoo, Michigan
Ethical Pharmaceuticals

Royale Laboratory — **Space 109**
Glendale, California
Ploss Constant Monitoring System and Monaural Stethoscopes

Automation Industries, Inc. — **Spaces 110-111**
FLEXIBLE TUBING DIVISION
Branford, Connecticut
Products for Anesthesia-Disposable conductive breathing circuit. Products for use with IPPB Aerosol and Ventilators.

Air-Shields, Inc. (Narco Medical Services) — **Spaces 112-113**
Warminster, Pennsylvania
Anesthesia Machine, VENTIMETER Ventilator, Amsterdam Infant Ventilator, DIA-Pumps, AMBUs (Adult and infant), ICV 10, Ultrasonic Nebulizer

A 5245

BOC Rx 22f-2-72

Vernitron Medical Products, Inc. — **Space 114**
Carlstadt, New Jersey
Steri-Sonic Cleaner/Disinfector

Sorenson Research Company — **Space 115**
Salt Lake City, Utah
Disposable Catheters and Suction Units

Ramtech, Inc. — **Space 116**
Tampa, Florida
RAMTECH BPMc/d-Disposable, Continuous Mean Arterial and Central Venous Blood Pressure Monitor

Organon, Inc. — **Space 117**
West Orange, New Jersey
PAVULON* Pancuronium Bromide

Dupaco, Inc. — **Spaces 118-119**
San Marcos, California
Anesthesia Apparatus and Accessories

Mediscience Technology Corp. — **Space 120**
Collingswood, New Jersey
MEDISYSTEMS ™ pO_2 Catheter

Veriflo Corporation — **Space 121**
Richmond, California
PV-110 Ventilator - Airway Pressure Monitor

Liquid Carbonic Corporation — **Space 122**
Chicago, Illinois

Olympic Surgical Company — **Spaces 123-124**
Seattle, Washington
Pasteurmatic, Vac-Pac, Arm-Deck, Auto-Count, Suture Ring, Oxyhood, Trach Button, Trach-Talk

Bourns Life Systems — **Space 125**
Riverside, California
Infant Ventilator, End Tidal CO_2 Monitor, Volumetric Controller

Harris-Lake, Inc. — **Spaces 126-127**
Cleveland, Ohio
Anesthesia Equipment and accessories

McNeil Laboratories, Inc. — **Spaces 128-129**
Fort Washington, Pennsylvania
INNOVAR* Injection

Illinois Tool Works, Inc. — **Space 130**
Elk Grove Village, Illinois
Disposable Anesthesia Circle

CONTINUED ON NEXT PAGE

A 5246 BOC RX 228-2-73

Technical Exhibitors, cont'd.

Pharmaseal ..... **Spaces 131-132**
Glendale, California
Disposable medical products including a complete line of Anesthesia and Medical Specialties products

Sierracin Corporation ..... **Space 133**
Sylmar, California
Apollo Radiant Warmer, Cradle Warmer

Datascope Corporation ..... **Spaces 134-135**
Paramus, New Jersey
Dual Trace Monitors: 850, 860; Blood Pressure Module, M/D 2 Monitor-Defibrillator

Williams & Wilkins Company ..... **Space 136**
Baltimore, Maryland
Medical books and periodicals related to anesthesiology and allied sciences

Video Digest, Inc. ..... **Space 137**
Cincinnati, Ohio
Video Tape Programs for the Continuing Education of Practicing Anesthesiologists

American Hospital Supply ..... **Spaces 138-139**
Evanston, Illinois

McGaw Laboratories ..... **Space 140**
Glendale, California
Humidifiers - R.P.M. Filters

Hewlett-Packard Company ..... **Spaces 141-142-143**
Waltham, Massachusetts
Systems and Instrumentation for Medical Care, Research and Teaching

Electronics For Medicine, Inc. ..... **Spaces 144-145**
White Plains, New York
Patient Monitors for Operating and Recovery Rooms, Computer-Assisted ICU/CCU Telemetry Multi-channel recorders

Valleylab, Inc. ..... **Space 146**
Boulder, Colorado
Solid-State Electrosurgery and Sterile Electrosurgical Disposables

Systems Research Laboratories, Inc. ..... **Space 150**
Dayton, Ohio
Automated Pulmonary Instrumentation

Jelco Laboratories ..... **Space 151**
Raritan, New Jersey
I.V. catheter products

O-R Products Company, Inc. ..... **Space 152**
Belmont, Massachusetts
O-R Conductive Footwear

A 5247 BOC RX 228-2-74

Technical Exhibitors, cont'd.

Dover Products ..... **Space 153**
Milwaukee, Wisconsin
Silicone Material (Disposable), Circle System, Silicone/Vinyl Endotracheal Tube

O'Neal, Jones & Feldman, Inc. ..... **Space 155**
St. Louis, Missouri
ANTILIRIUM

Medical Systems Corporation ..... **Space 156**
Great Neck, New York
Electrocardiographs, Pulsemeter, Blood Pressure Monitor

Eschmann U.S.A., Inc. ..... **Space 157**
Wellesley Hills, Massachusetts
Endo Tubes, Rebreathing Bags, Brighton Balloons

OEM Medical ..... **Space 158**
Edison, New Jersey
Respiratory Therapy

The Burdick Corporation ..... **Space 159**
Milton, Wisconsin
Coronary Care Center, Electrocardiograph, Difibrillator and Emergency equipment

Charles C. Thomas, Publisher ..... **Space 160**
Springfield, Illinois
Medical books published by Charles C. Thomas, Publisher

Vitalograph Limited ..... **Spaces 161-162**
Buckingham, England

Leyland Medical Products ..... **Space 163**
Lancaster, England

Medical & Industrial Equipment Ltd. ..... **Spaces 164-165**
London, England

Warne Surgical Products Ltd. ..... **Spaces 166-167**
Andover, Hants, England

The DeVilbiss Company ..... **Space 168**
Somerset, Pennsylvania
DeVilbiss Ultrasonic Nebulizers

Roche Laboratories ..... **Spaces 170-171-172-173**
Nutley, New Jersey
Dalmane, Valium, MSL

Parke, Davis & Company ..... **Spaces 174-175**
Detroit, Michigan
Ketalar

CONTINUED ON NEXT PAGE

A 5248 BOC Rx 228-2-75

Technical Exhibitors, cont'd.

Chemetron Corporation — **Spaces 176-177**
Chicago, Illinois
Piping systems for anesthesia, outlets and secondary equipment for suction, ceiling-mounted units, anesthesia machines, Baralyme

Little, Brown and Company — **Space 183**
Boston, Massachusetts
Medical books and periodicals

British Oxygen Company Ltd. — **Spaces 184-185-186**
Harlow, Essex, England

Reid & Sigrist Ltd. — **Space 187**
Leicester, England

Portex Ltd. — **Spaces 188-189-190-191**
Kent, England

Arnar-Stone Laboratories, Inc. — **Space 193**
Mount Prospect, Illinois
Americaine Sopor

Grumman Health Systems — **Spaces 198-199**
Woodbury, New York
Operating Room Control Console

Cal-Med Electronics Company — **Space 207**
Los Angeles, California
SONY and other tape-recorders, car adaptors for digest tapes, etc.

A 5249

19 May 1980

D R Harris Hammersmith House

Mr JA Perham, Canox

BOC RX 234

Dear Allan,

GARDNER CRYOGENICS

I was visiting Frits Loos whom I have known for many years on 31 March and when he met me at the airport he was very full of the fact that he had just then been meeting with people from Gardner Cryogenics and he told me that Multigas which is a company 50% CL Loos and Co and 50% Dutch State Mines (DSM) had acquired Gardner Europe and that the facilities that Gardner have at Brussels for receipt and redistribution of helium would be integrated into the Multigas system. He also told me that long term contracts for the supply of liquid helium had been arranged at the same time. I asked him if this was to get the Multigas operation going ahead of time or whether it was to augment the ultimate output from DSM which was expected to be in the order of 10 million cu.ft p.a., and he confirmed that both reasons were valid.

Later on 6 May when I was visiting Messer Griesheim in Dusseldorf they told me that Frits Loos had informed them about the Multigas/Gardner Europe situation.

However, when I was visiting L'Air Liquide last week they were almost categorical in the context that no disposal of Gardner Europe had been effected by Gardner Cryogenics. They further told me that a Mr JF Lanphier, vice-president of Carpenter Technology, was in charge of Gardner Cryogenics and that he had stated no disposal had been effected.

I wonder if it would be possible for you to make contact with Lanphier possibly on the basis that '..... you have heard a rumour that Gardner Europe has been disposed of to Multigas ..... is it possible for him to tell you the true situation?'.

I am sorry that the above looks a cross between a name dropping exercise and a travelogue but as you know it is the fitting together of small pieces of information which eventually can tell you an interesting answer and in this case we do want to know where Gardner Europe stand today.

With kind regards,

Yours sincerely,

D R Harris

BOC Rx 243

A 5250

PERCENT RETURN* ON TOTAL
INVESTED CAPITAL

Year	Airco	Air Products	Chemetron	Big Three	Burdett	Union Carbide
1973	4.4	7.2	4.5	9.8	1.1	9.5
1972	4.1	5.7	3.5	8.9	(2.5)	7.3
1971	4.2	5.1	1.8	7.1	(7.4)	5.5
1970	3.8	5.3	3.2	6.9	(4.3)	5.8
1969	4.6	5.6	4.7	6.6	0.3	6.9
1968	4.9	5.3	5.3	7.2	2.3	6.0
1967	6.5	4.8	9.2	7.6	2.7	6.7
1966	8.1	4.6	10.1	9.7	3.6	11.3
1965	7.6	4.5	9.7	9.5	3.2	11.7
1964	5.8	4.7	7.1	7.4	5.4	10.9
1963	5.9	5.0	5.7	n.a.	n.a.	10.2

*Percent return = Net income divided by total invested capital x 100.

Boc Rx 244

A 5251

PERCENT RETURN ON STOCKHOLDERS' EQUITY
(After Taxes)

	1973	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963
Airco	7.0	6.9	7.1	6.6	7.8	7.8	10.3	12.8	12.1	9.4	9.0
Air Products	11.4	9.8	9.6	9.8	10.1	9.4	9.7	9.3	10.4	10.0	10.7
Chemetron	6.2	5.0	2.6	4.9	7.4	7.3	10.7	14.8	13.6	9.8	8.0
Big Three	12.9	11.3	13.7	15.4	12.1	12.4	13.8	16.3	15.6	17.5	n.a.
Burdett	6.0	(16.9)	(43.2)	(18.2)	0.9	5.3	6.9	7.5	5.4	6.6	n.a.
Union Carbide	13.8	10.7	8.3	8.7	10.5	9.2	10.3	15.6	16.7	15.2	14.2
All Chemicals	14.9*	12.8	11.8	11.5	12.8	13.3	13.1	15.1	15.3	14.4	12.9
All Manufacturing	12.6*	10.6	9.7	9.3	11.5	12.1	11.7	13.5	13.0	11.6	10.3

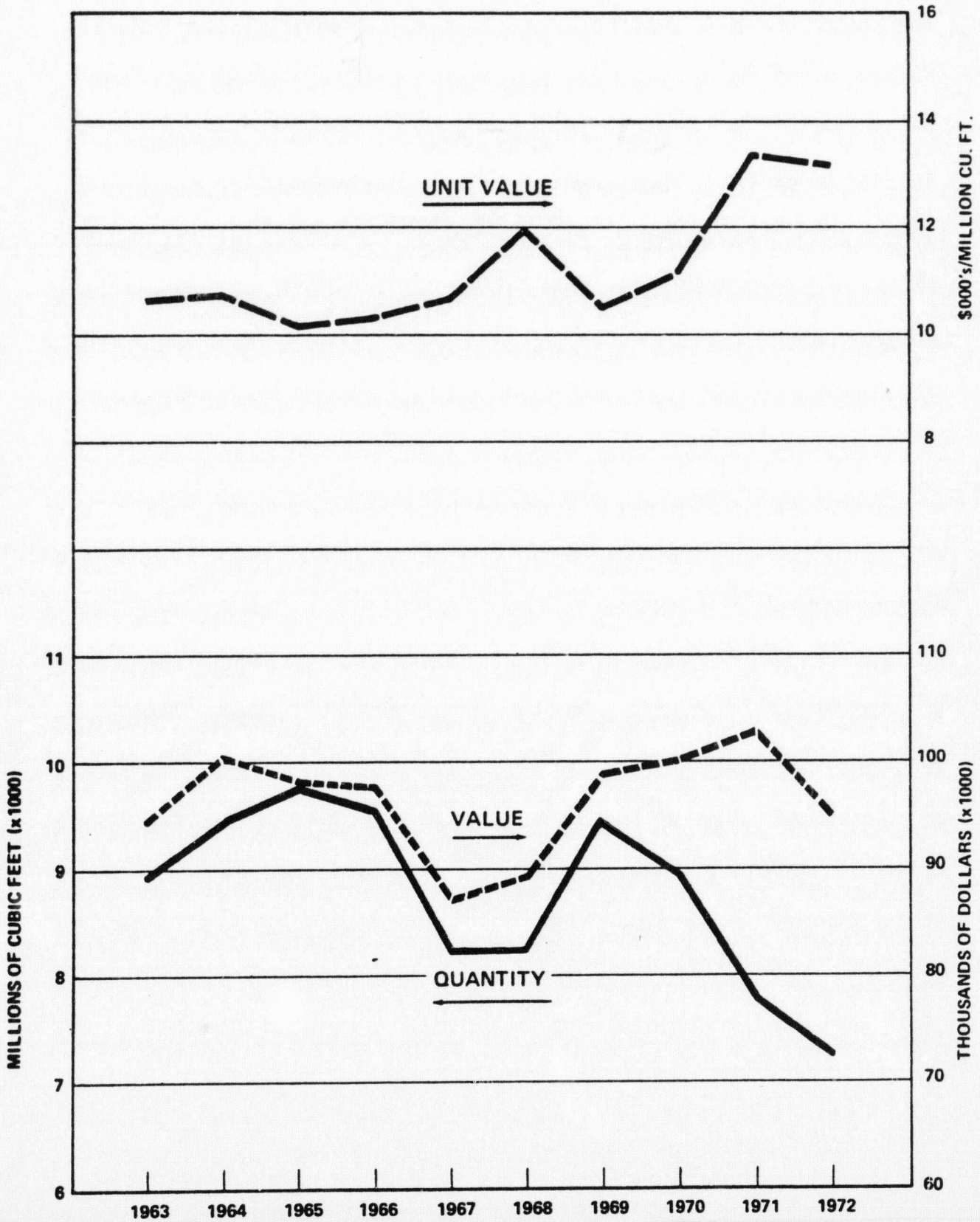
*Based on 1st three quarters of 1973.

A 5252

Boc Ex 246A

ACETYLENE SHIPMENTS

TOTAL

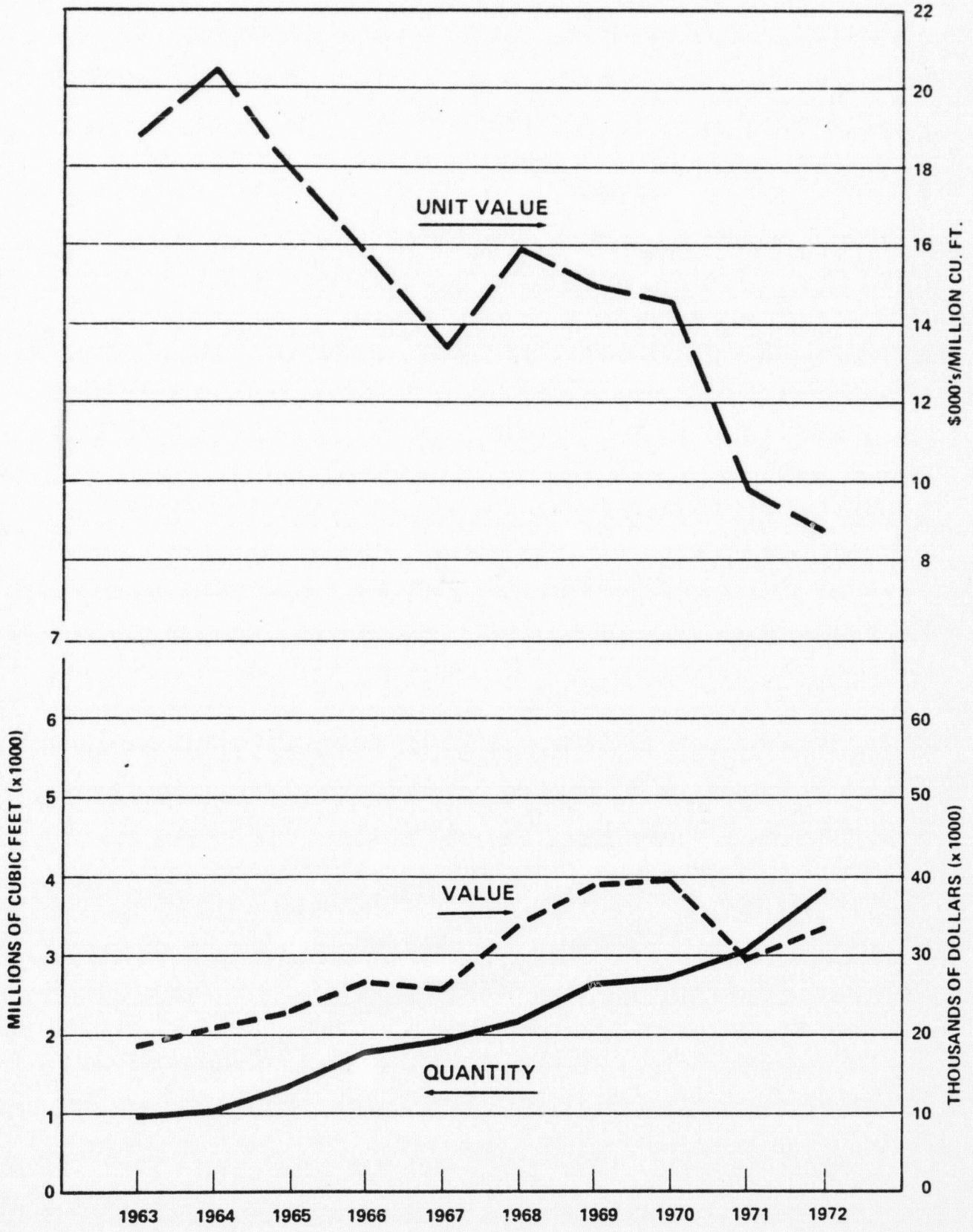


A 5253

Boc Rx 246 B

ARGON SHIPMENTS

TOTAL

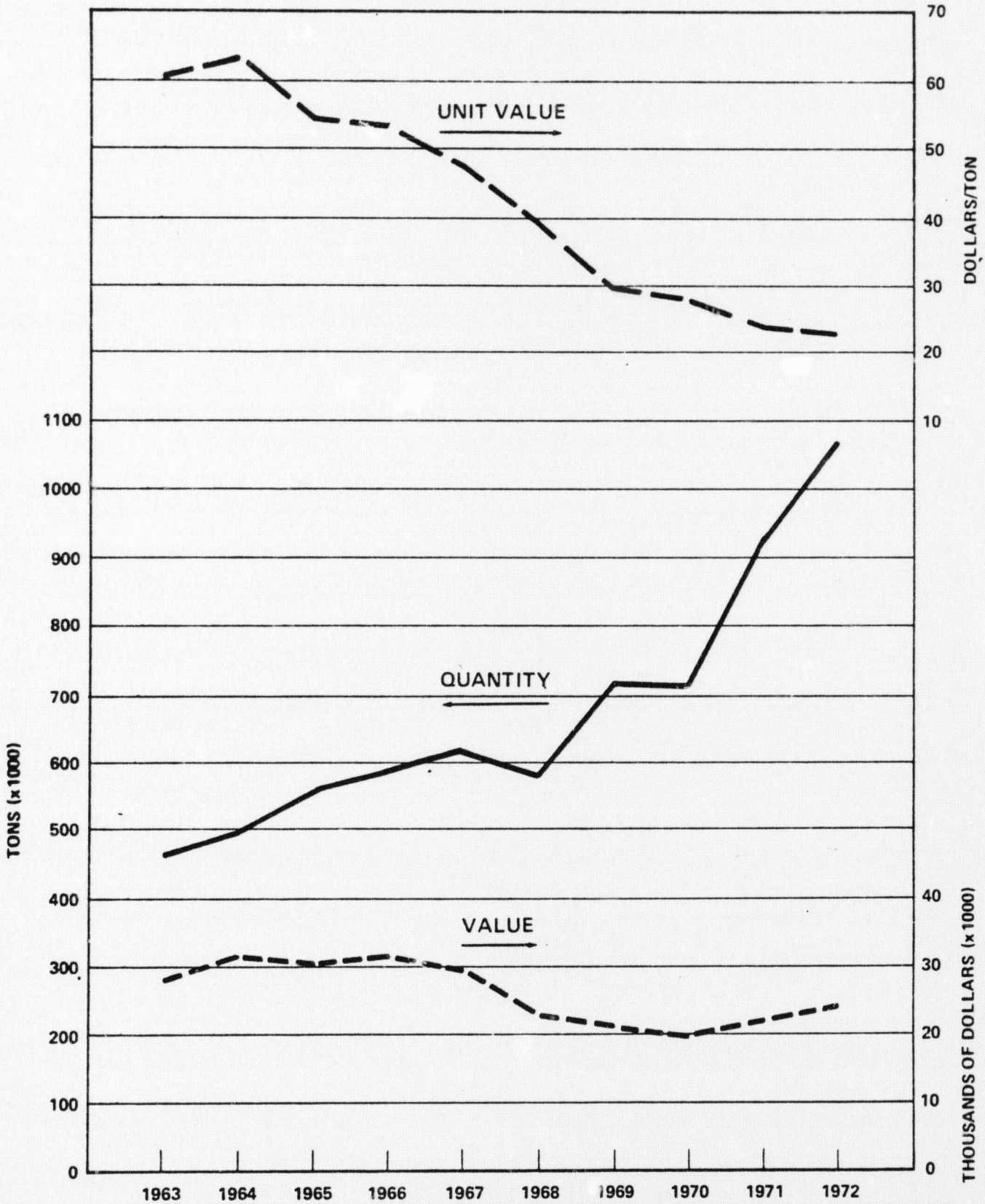


A 5254

Boc Rx 246 C

CARBON DIOXIDE SHIPMENTS

LIQUID AND GAS

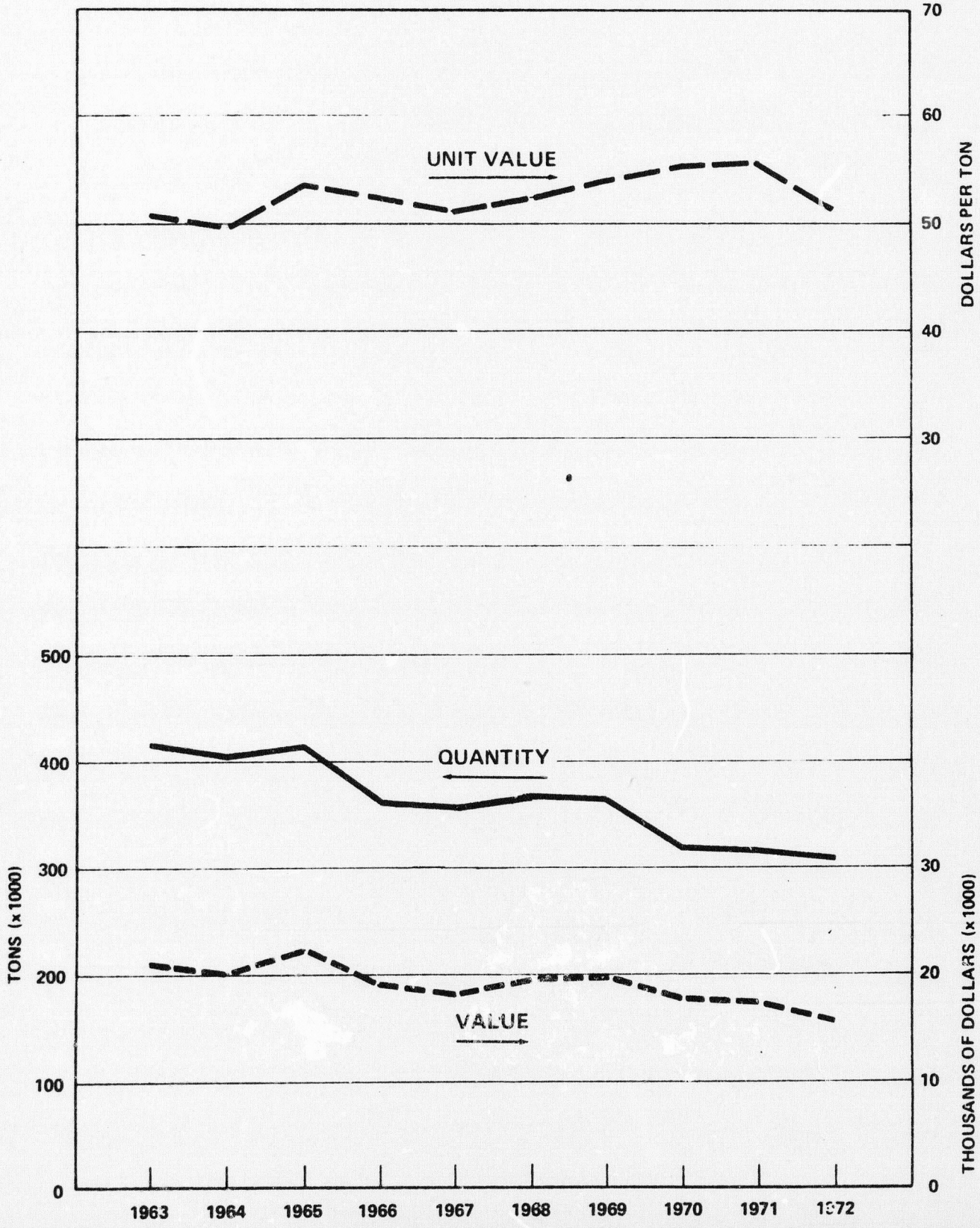


A 5255

BOC RX 246 D

CARBON DIOXIDE SHIPMENTS

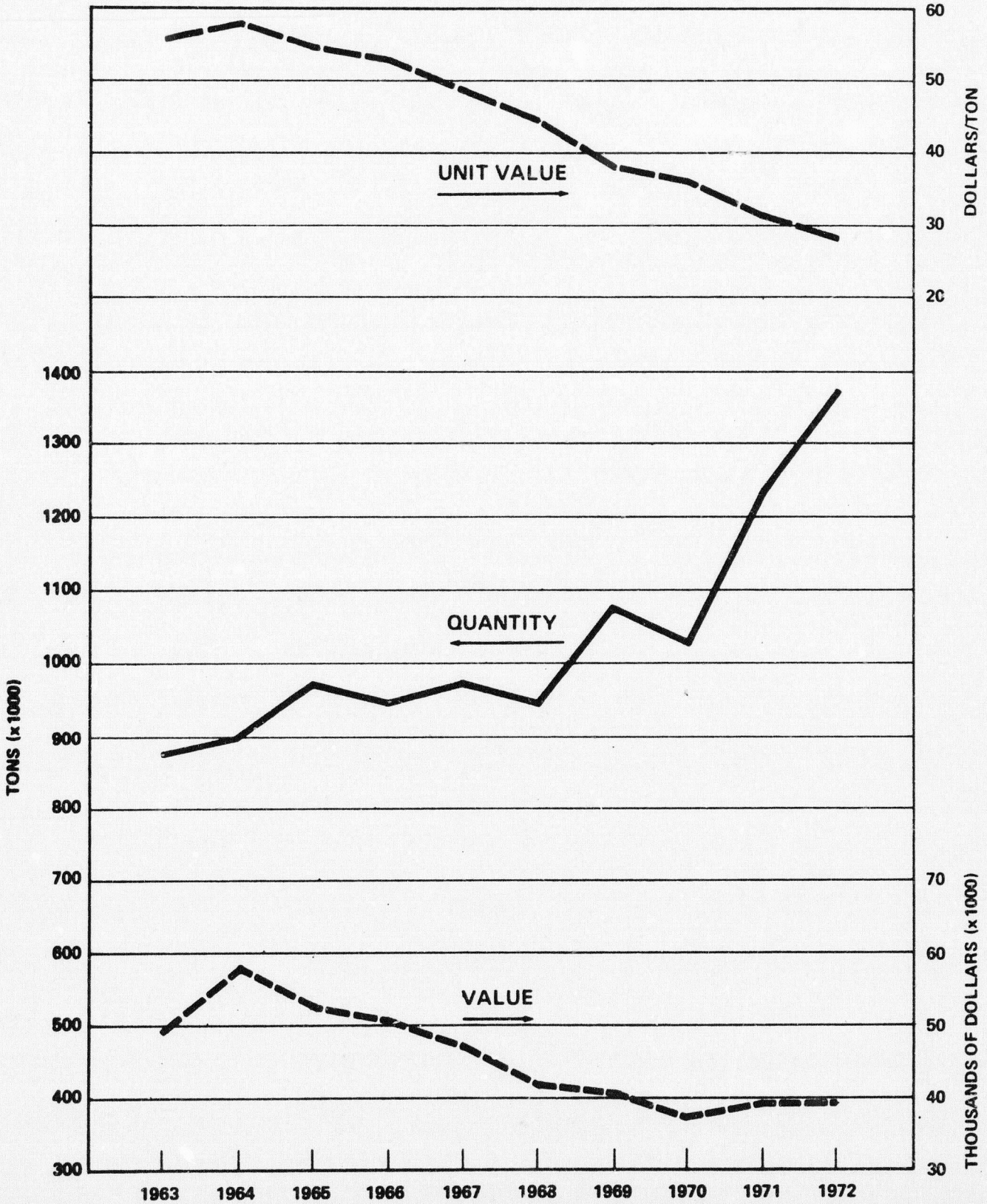
SOLID



A 5256 Boe Rx 246 E

CARBON DIOXIDE SHIPMENTS

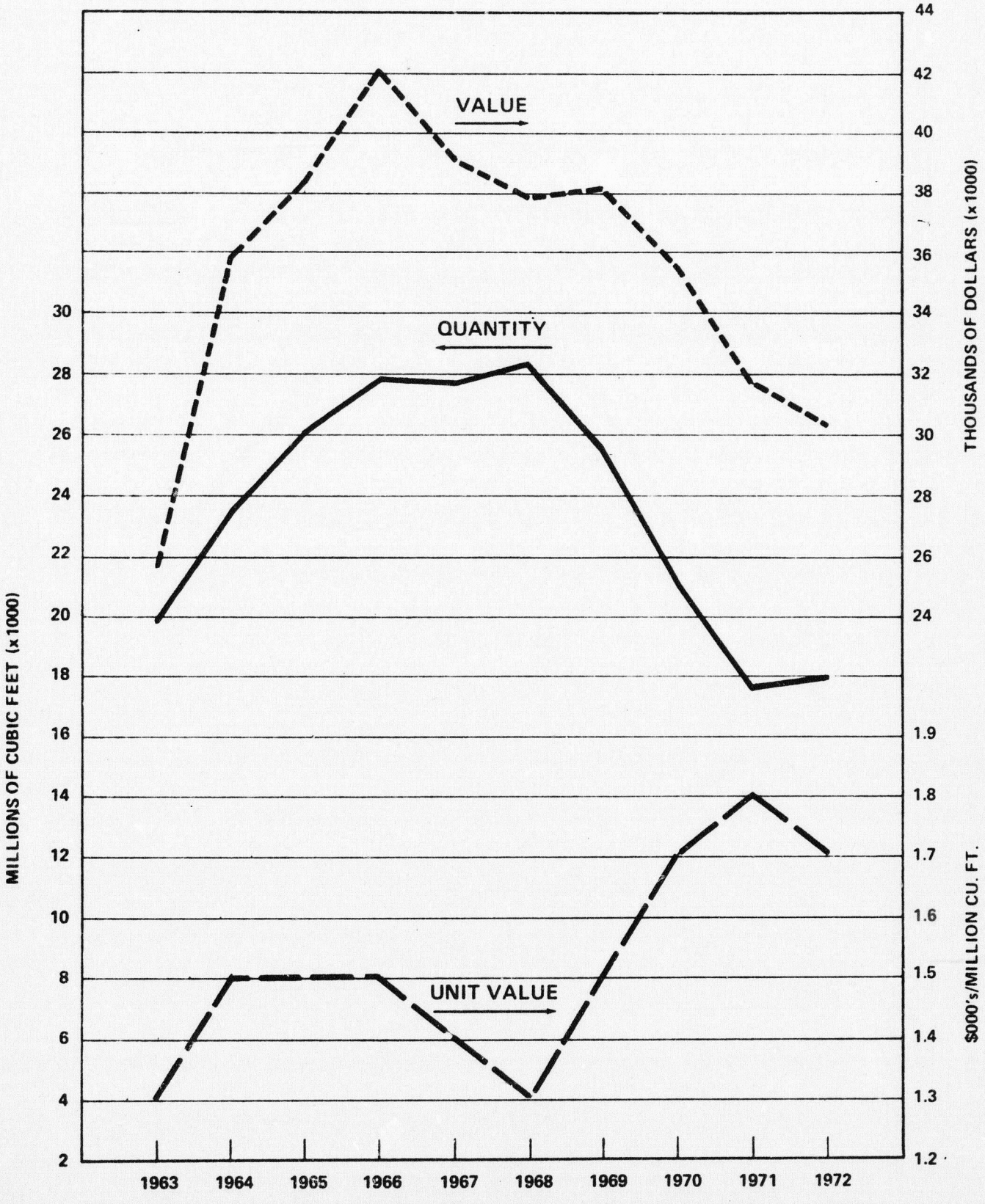
TOTAL



A 5257 BOC Rx 246 F

HYDROGEN SHIPMENTS

TOTAL

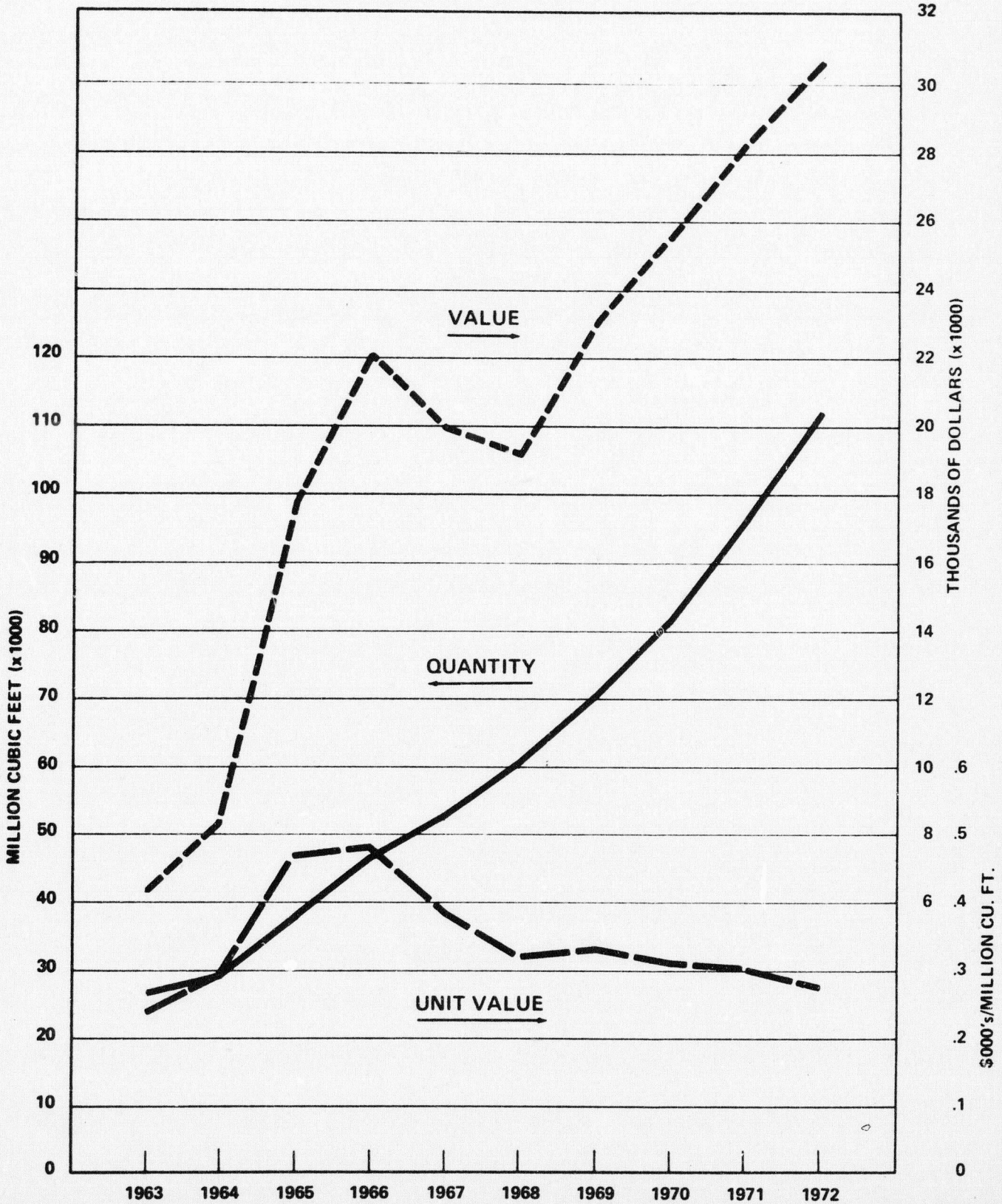


A 5258

Boc Rx 246 G

NITROGEN SHIPMENTS

GAS PIPELINE

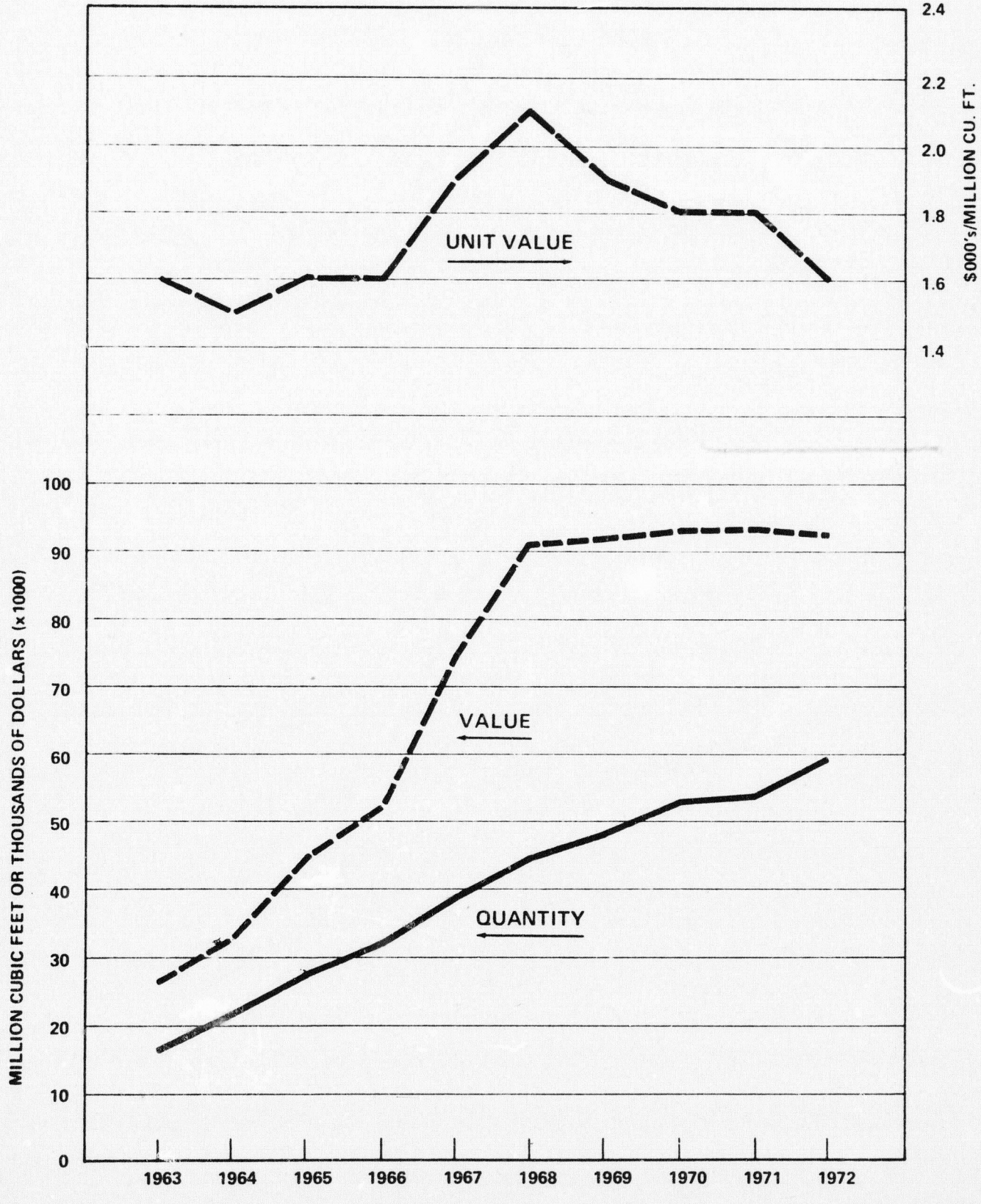


A 5259

BOC Rx 246 H

NITROGEN SHIPMENTS

LIQUID – CYLINDER AND BULK

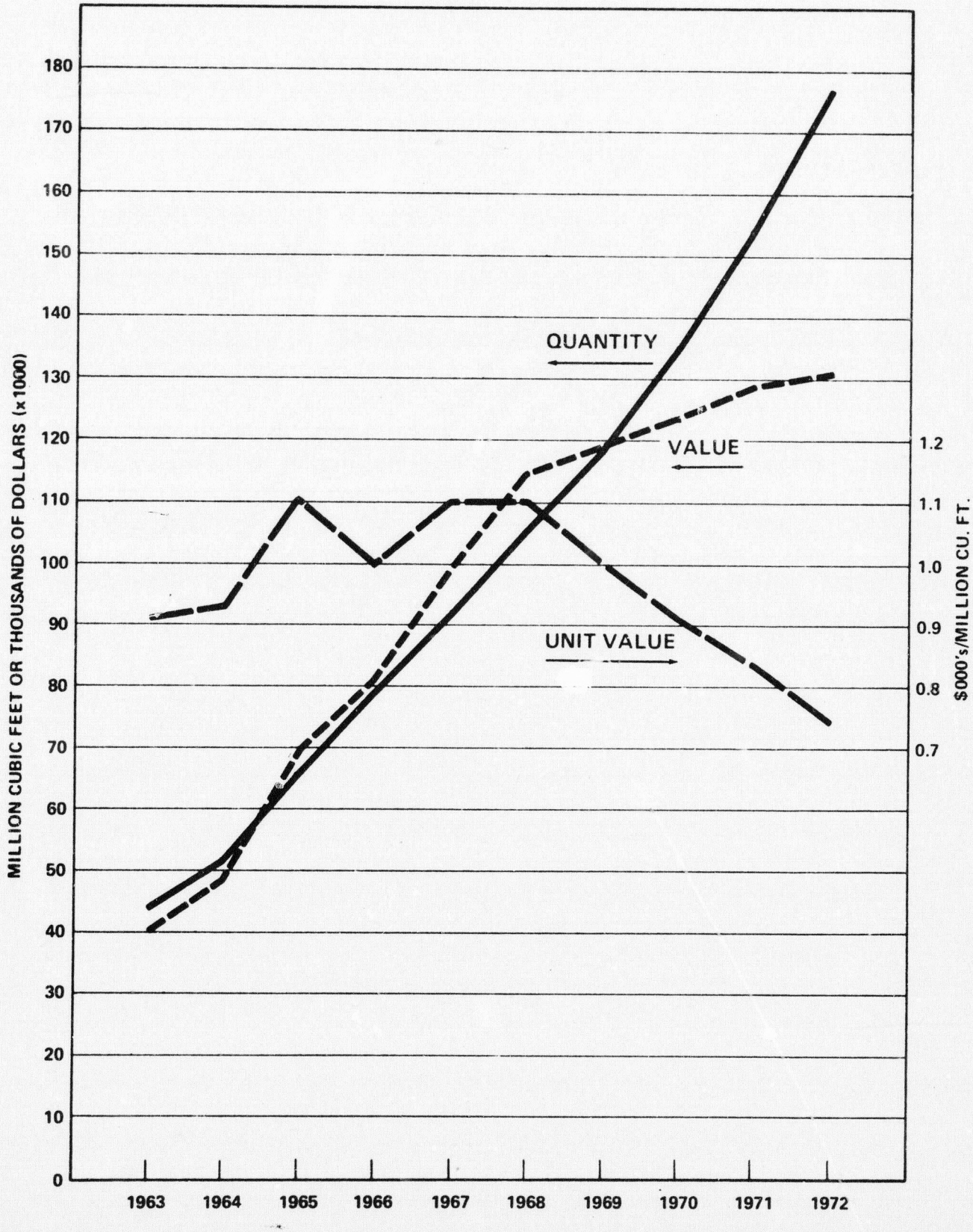


A5260

Boc Rx 246 I

NITROGEN SHIPMENTS

TOTAL

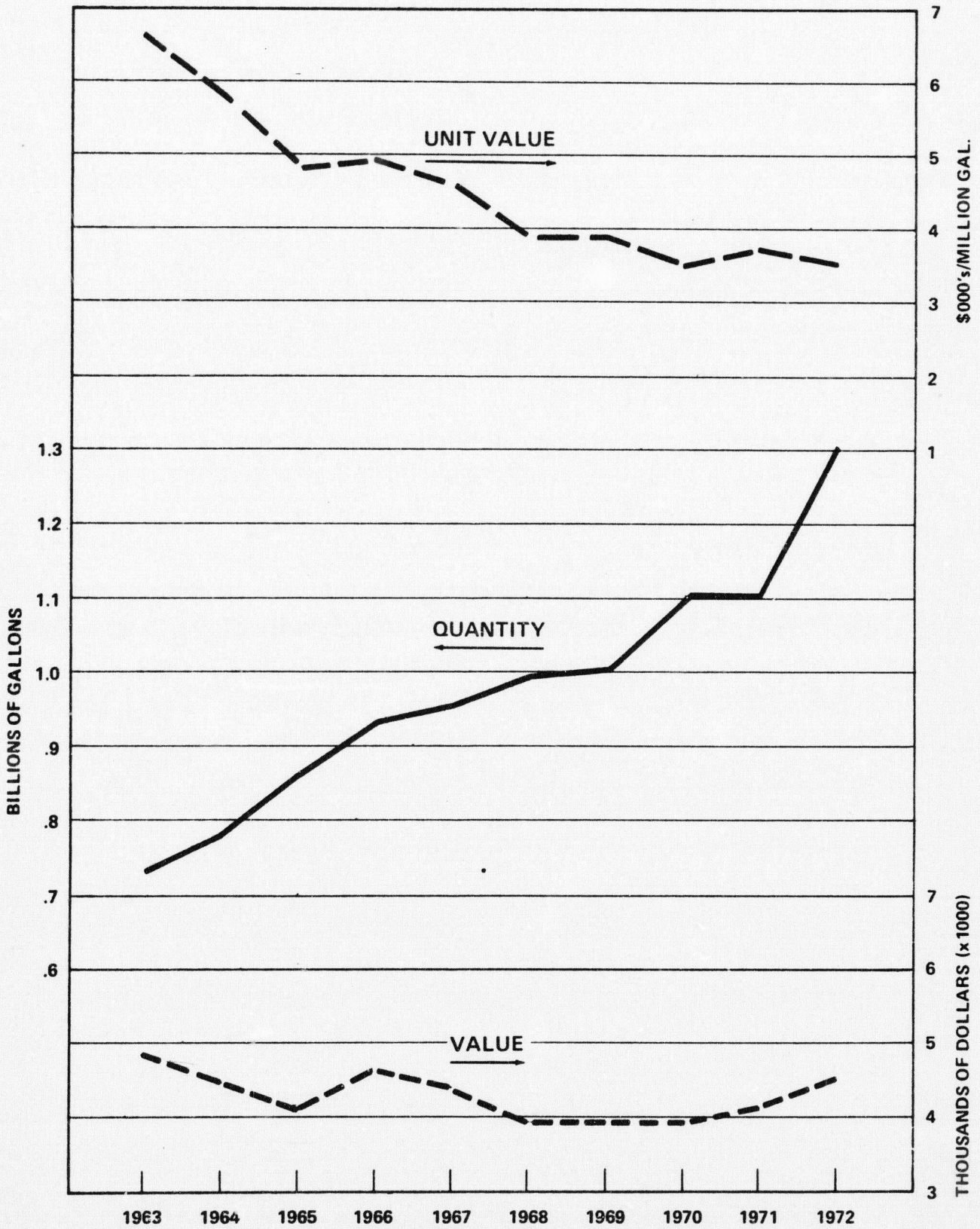


A 5261

Boc Rx 246J

NITROUS OXIDE SHIPMENTS

TOTAL

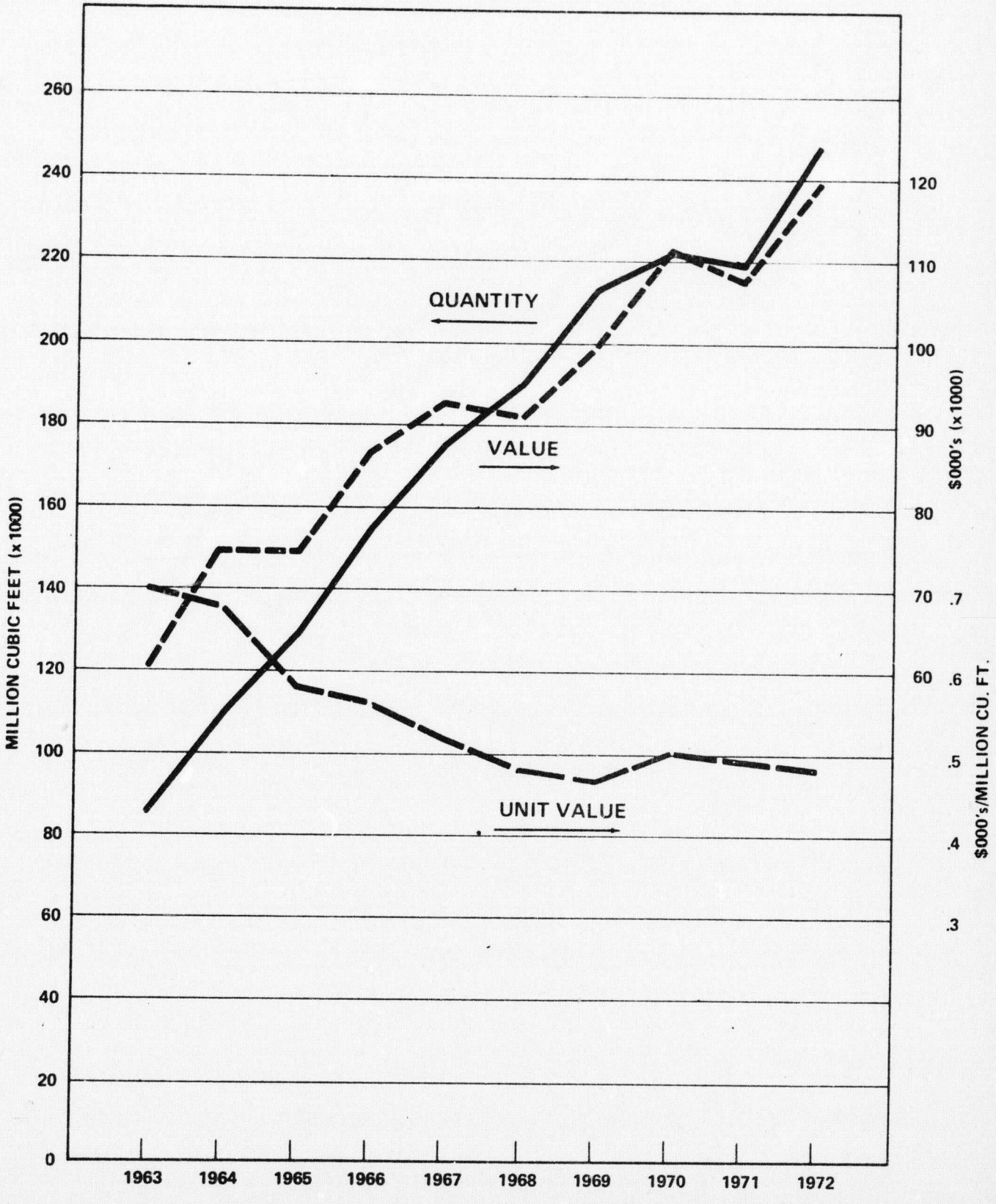


A 5262

BOC Rx 246K

OXYGEN SHIPMENTS

GAS PIPELINE

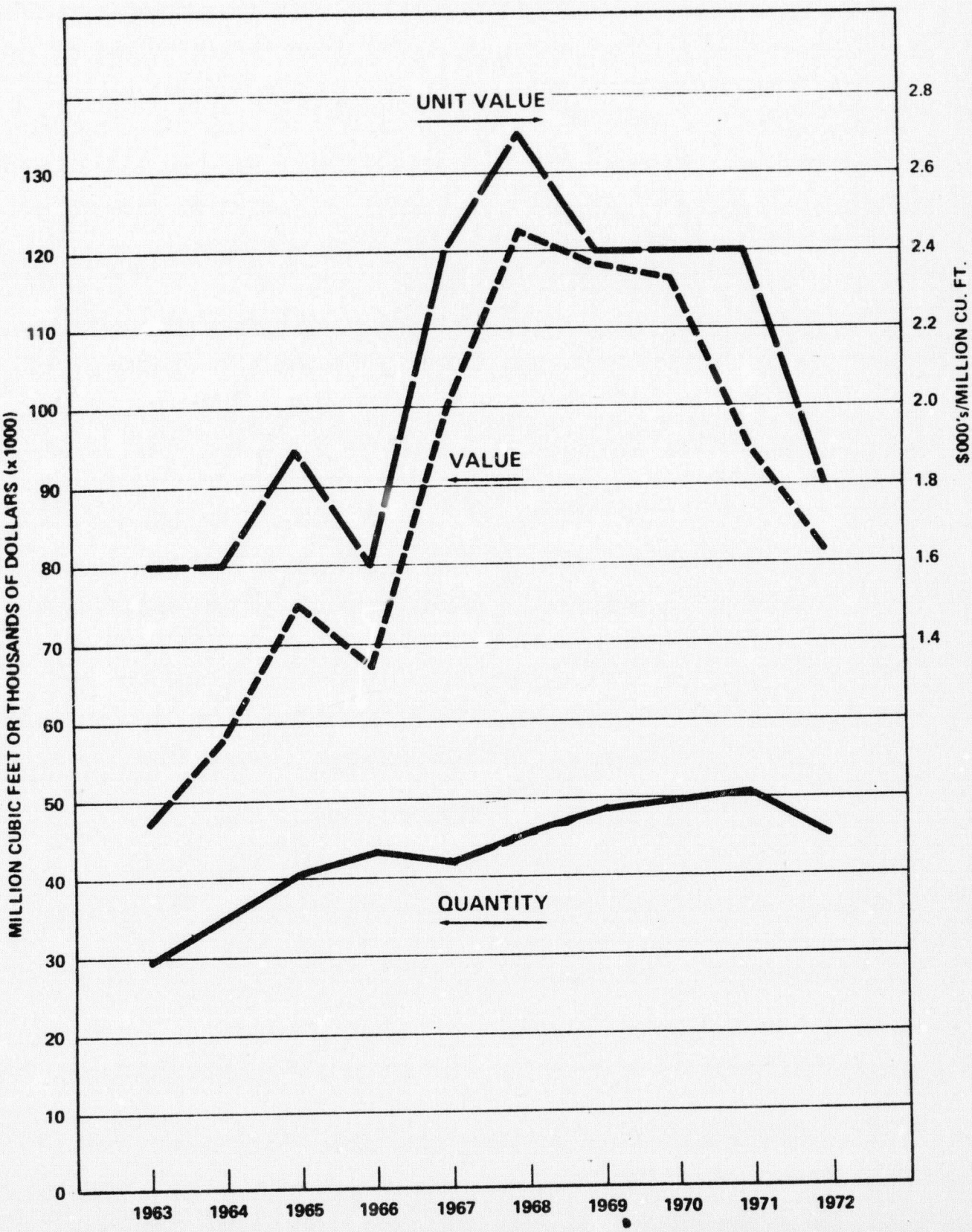


A 5263

BOC RX 246 L

OXYGEN SHIPMENTS

LIQUID – CYLINDER AND BULK

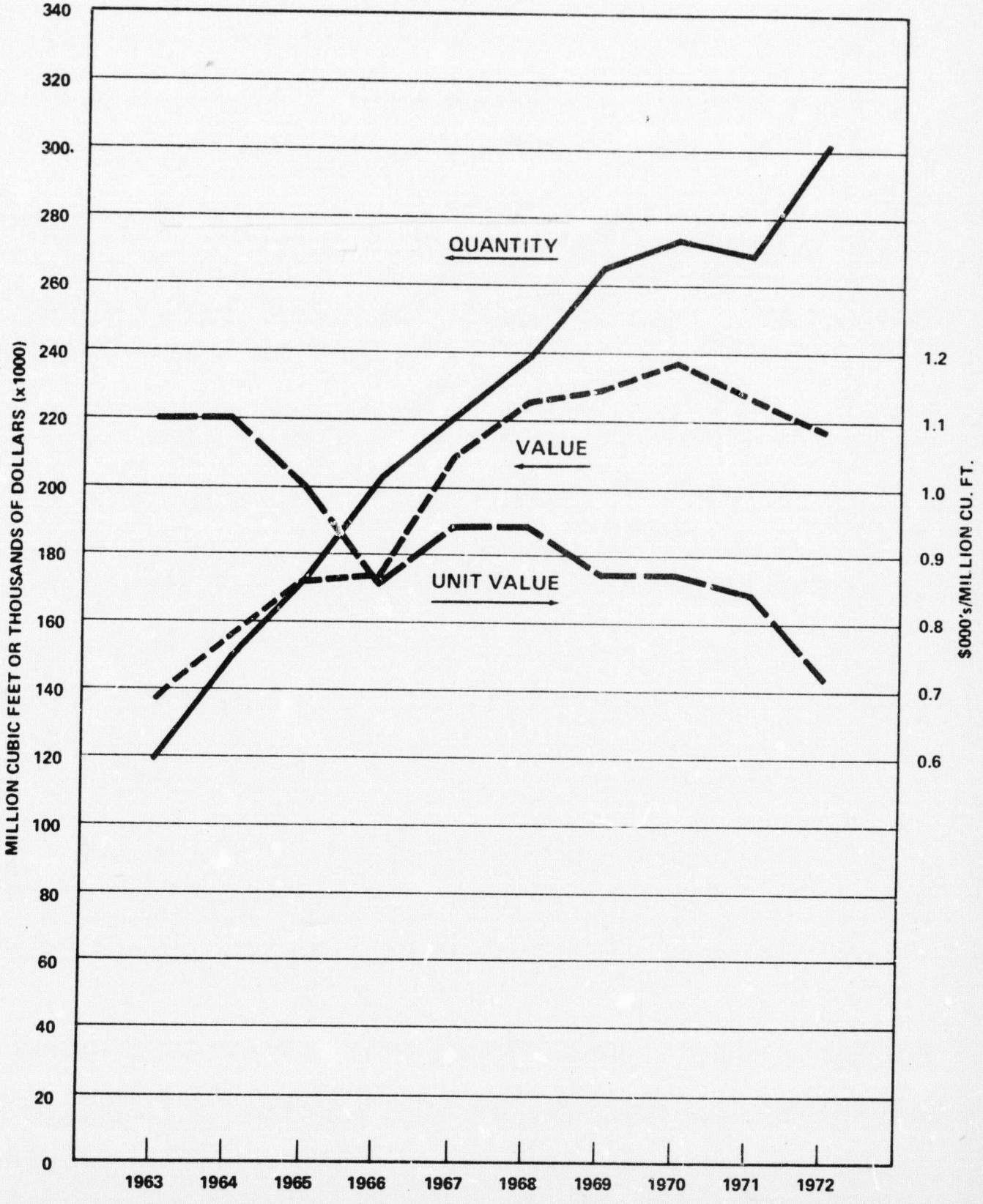


A 5264

BOC Rx 246m

OXYGEN SHIPMENTS

TOTAL



(NOT IN EVIDENCE) A 5265 BOC PX 260A

Review and Forecast 33rd Annual Meeting

May 8, 9 and 10, 1973

Papers Presented at the May 1973
Meeting of The Chemical Marketing Research
Association Held in New York City

A 5266 Box RK 2408

CMPA
Paper
805

William N. Perry
Planning Coordinator
Air Products and Chemicals, Inc.
Allentown, Pennsylvania

Oxygen and nitrogen, the principal co-products when air is separated, are physically familiar to everyone except those living in the most purified atmospheres, and well known chemically to every veteran of a high school chemistry course. Similarly, commercial uses of the gases may be observed in even small garages or repair shops where simple oxy-acetylene cutting or welding is practiced. Nonetheless, only that small proportion of CPI people who have been directly involved with the commercial industrial gas industry are generally aware of more than the "tip of the iceberg."

The value of shipments of oxygen in the U. S. is $360 million annually at plant prices with growth over the past ten years averaging approximately 7% per year. Nitrogen adds another $150 million per year with growth averaging 14% per year. In order to understand this large and growing industry and where it is going, it is first necessary to review where it has been. As with all men and organizations, the industrial gas business is a product of its history.

From the first isolation of oxygen by Priestley in 1774 and nitrogen by Rutherford in 1772 until the mid-nineteen fifties, these elemental gases were purified and sold on a comparatively small scale for welding and hospital breathing gas. Production facilities were small and widely scattered to handle local needs. With apologies to companies active in the industry earlier, oxygen and nitrogen did not become important U. S. chemical commodities until after the widespread adoption of oxygen steel melting, and particularly the Basic Oxygen furnace, by the steel industry in the mid- to late fifties. During the same period, air separation plant construction for the chemical industry also accelerated, but not at as great a rate. The following chart shows the relationship between the growth of U. S. steel industry oxygen consumption and total U. S. oxygen consumption.

	Steel Industry Oxygen Consumption Billion Cu Ft	Total Oxygen Consumption Billion Cu Ft	% of Oxygen Consumption by Steel Industry
1955	18.0 (e)	48.0 (e)	37.5
1961	71.0	109.6	65.0
1966	100.8	253.1	63.5
1967	175.0	268.1	65.0
1968	181.7	280.0	64.0
1969	214.6	314.0	68.3
1970	219.6	318.3	68.0
1971	207.3	314.0 (e)	66.0

BEST COPY AVAILABLE

A5267 Boc Nx 260c

The explosive growth of the steel industry oxygen requirement during the sixties created a "seller's market" very favorable to the companies able to demonstrate competence in industrial gas technology. It was common practice for a qualified supplier to receive a guaranteed "take or pay" contract from a steel producer and then use that contract as collateral for loan funds for plant construction. In other words, funds were available for new suppliers entering the industry with basic technical competence. As in most commercial situations in which funds are readily available for industry entry, competition was intense. This highly competitive atmosphere resulted in declining prices as the companies in the industry tried to gain market share.

	Oxygen & Nitrogen Unit Value Index
1961	1.00
1963	.75
1965	.68
1967	.73
1969	.60
1970	.64
1971	.62

Fortunately, these prices were not the only result of the rapid growth of air separation facilities and the competitive atmosphere. Other healthier results of the competition were the emergence of a "merchant market," widely available low cost co-product nitrogen, and a great deal of technical activity devoted to the development of new applications.

The "merchant market" as defined here includes that oxygen or nitrogen which is transported by truck or rail to customers with requirements too small to justify on-site generators. This market received great impetus from the rapid spread of air separation plants. Many of the suppliers were able to include liquefication facilities, bulk truck filling stations, and small cylinder filling equipment in their new air separation plants built to service steel or chemical customers at incremental cost. More recently, suppliers have built plants exclusively to service this merchant segment of the oxygen-nitrogen market.

The sale of co-product nitrogen from the air separation plants was important in every industry requiring relatively inert gas for shielding, blanketing, and pressuring oxygen sensitive materials. Particularly important consuming industries were chemicals, metallurgy, and electronics component manufacture.

Among the more important new applications developed were those which resulted from the extremely low temperatures associated with liquid nitrogen (-320°F). A liquid at that temperature permits controlled quick freezing of foods, deflashing of rubber molded goods, embrittlement of metals, shrink fitting of metals, grinding at low temperature of heat sensitive materials, and many other applications.

The combined effect of
oxygen-nitrogen, devel
total market volumes i

Co

1960
1962
1964
1966
1968
1970
1972

Avg. Annual Growth, 62-
Avg. Annual Growth, 68-

This brief history of t
industrial gas business
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national recession coup
period has created temp
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The opportunities avail
they have been in the p
the widespread applicat
those properties. The
1972.

Chemical Process
Primary Metals
Metal Fabrication
Electronics
Low Temperature Process
Other

Shipments, MMSCF
% of Shipments
% of Revenues

A 5268

The combined effect of the widespread availability of comparatively low cost oxygen-nitrogen, development of a merchant market, and new applications on total market volumes is shown in the following table.

Consumption in Billion Cubic Feet

	Total Oxygen Consumption	Merchant Oxygen Consumption	Total Nitrogen Consumption	Merchant Nitrogen Consumption
1950	86,900	23,800	27,100	-
1962	137,800	30,200	34,900	15,200
1964	204,300	39,100	51,300	22,400
1966	255,100	47,400	78,700	33,600
1968	230,900	40,200	105,400	46,200
1970	319,300	52,200	134,900	58,600
1972	367,100	56,700	169,500	74,600
Avg. Annual Growth, 62-72	10.4%	6.3%	17.1%	17.2%
Avg. Annual Growth, 68-72	5.3%	3.6%	12.6%	12.3%

This brief history of the industry brings us to the present. Today the industrial gas business still has problems, but there are equal or greater opportunities. Among industry problems, prices and consequently profits are still depressed, although several recent price increases have helped to balance cost increases and improve margins. Costs continue to rise, especially in such sensitive areas as electric power, transportation, and construction. Finally, the lack of new air plant construction during the recent recession coupled with large demand growth during the recovery period has created temporary product shortages in some areas of the country. This situation should be corrected within a short time since many construction projects are now underway.

The opportunities available to elemental oxygen and nitrogen are based, as they have been in the past, on the unique properties of these chemicals and the widespread applications which a variety of industries have found for these properties. The following table shows the consumption by industry for 1972.

1972 Markets for Oxygen-Nitrogen
(Billion Cubic Feet)

	Oxygen		Nitrogen	
	Total Consumption	Merchant	Total Consumption	Merchant
Chemical Process	67,200	2,600	33,000	13,600
Primary Metals	203,300	28,700	7,600	7,600
Petroleum Refining	15,000	2,300	10,900	1,400
Electronics	-	-	10,700	10,600
Low Temperature Process	-	-	-	11,000
Other	-	1,000	28,300	6,000
Shipments, MMSCF	367,100	56,700	94,900	74,200
% of Shipments	57.9	10.8	18.0	14.2
% of Revenue	22.	25.	17.	33

A 5269 BOC Rx 240E

Steel and chemical requirements continue to dominate the pipeline gas market but the increasingly important merchant market based upon liquid and small cylinder delivery includes customers from a wide spectrum of industry.

During the next five years, both oxygen and nitrogen should continue to enjoy substantial growth. For oxygen in particular, the national concern with the environment offers a variety of new challenges. Every major oxygen supplier is currently actively involved in projects for treatment of sewage and industrial wastes with oxygen. The question is not whether these methods will be adopted but when. Metallurgical applications for oxygen usage are also expanding rapidly as companies consolidate facilities into larger, more efficient facilities with more effective but expensive antipollution devices.

Nitrogen also has growing usefulness in projects offering potential for an improved environment, particularly in the area of scrap recovery. Again, major suppliers are actively developing methods for reduction of scrap materials to forms suitable for recycling through low temperature technology. These new nitrogen market opportunities are in addition to still developing markets in special atmospheres for electronics, chemicals, metals, glass, and rubber, and far-from-exhausted potential in food freezing.

Projections of market size in five years are shown in the following table:

1973 Markets for Oxygen-Nitrogen
(Million Cubic Feet)

	Oxygen		Nitrogen	
Chemical Process	Pipeline & Captive	Merchant	Pipeline & Captive	Merchant
Primary Metals	75,400	3,750	52,700	29,400
Metal Fabrication	257,000	32,000	9,100	10,200
Electronics	16,000	35,400	17,900	20,000
Low Temperature Process	-	-	14,300	29,000
Other	-	-	-	26,800
	20,000	4,700	40,200	7,100
Shipments, MMSCF/Year	369,400	75,850	134,200	122,800

A 5270 Box Rx 260 F

Seven major producers and several regional suppliers currently produce purified elemental oxygen and nitrogen in the United States. The major suppliers ranked in order of decreasing size are shown below:

Linde Division
of Union Carbide

Airco, Inc.

Air Products and Chemicals, Inc.

National Cylinder Gas
Division of Chemetron

Liquid Carbonic
Division of Houston Natural Gas

Big 3 Industrial Gas and Equipment

Liquid Air, Inc.
Subsidiary of L'Air Liquide

Although there may be shifts in relative rank, the same companies should [illegible] to dominate the U. S. production of oxygen and nitrogen for the foreseeable future. These firms are large, financially stable organizations with integrated systems of production, marketing, development, and manage-[illegible]

[illegible] U. S. oxygen and nitrogen industry has historically suffered [illegible] periods of very rapid growth. At various times in the past [illegible] this industry has suffered from rapidly rising costs, inadequate [illegible] capacity, overcapacity, and a bad economic climate. [illegible] the first decade, but the markets for these commodity gases [illegible] growing and will grow in the future at rates which will make the [illegible] problems justified to the integrated producers.

(NOT IN EVIDENCE)

A 5271

BOC RX 261A

Annual Statistical Report

AMERICAN IRON AND STEEL INSTITUTE

1973

AMERICAN IRON AND STEEL INSTITUTE
1000 16TH STREET, N. W., WASHINGTON, D. C. 20036

A 5272

BOC RX 261B

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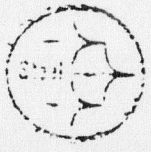


A 5273

BOC RX 261C

TABLE 47—CONSUMPTION OF ELECTRIC POWER BY THE IRON AND STEEL INDUSTRY

(Millions of kilowatt hours)

Years	Generated	Purchased	Total
1973	11,570	45,930	57,500
1972	12,198	39,358	51,556
1971	11,164	37,481	48,645
1970	11,749	37,833	49,582
1969	11,702	36,691	48,393

Similar data not available prior to 1943.

TABLE 48—CONSUMPTION OF OXYGEN BY THE IRON AND STEEL INDUSTRY

(Millions of cubic feet in gaseous form)

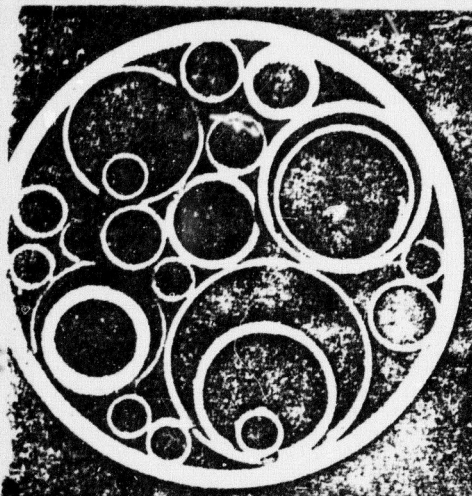
	1973	1972	1971	1970	1969
Purchased (a)	231,097	208,160	180,386	192,966	189,317
Produced (b)	34,090	25,644	26,899	26,641	25,243
TOTAL	265,187	233,804	207,285	219,607	214,560
Consumption by Uses:					
Conditioning	17,811	18,228	16,121	15,942	17,081
Scrap preparation	1,862	1,592	1,651	2,808	1,972
Other burning and welding	3,398	3,733	3,885	3,609	3,840
Blast furnaces	20,997	15,512	13,311	13,528	9,078
Steelmaking:					
Open hearth	48,59[illegible]	43,395	33,564	51,640	58,712
Basic oxygen process	159,623	138,057	121,207	120,336	114,175
Electric	6,945	8,076	6,916	5,839	4,891
Total Steelmaking	215,163	189,528	166,687	177,815	177,778
Maintenance and construction	1,339	1,126	988	970	728
All other	4,617	4,065	4,642	5,135	4,083
TOTAL	265,187	233,804	207,285	219,607	214,560

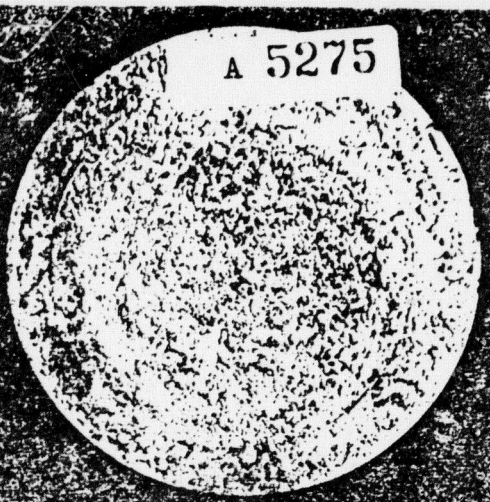
(a) Purchased from vendors with facilities in or adjacent to plant or facilities located away from plant.
(b) Produced on companies own facilities or leased facilities.
NOTE: Oxygen consumed in liquid form was reduced to its gaseous equivalent in these statistics.
Similar data not available prior to 1956.

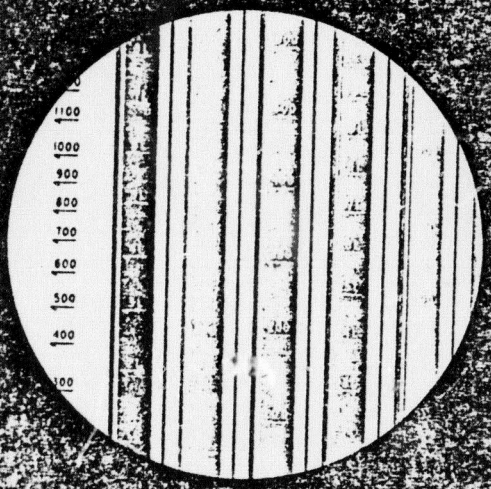
A 5274

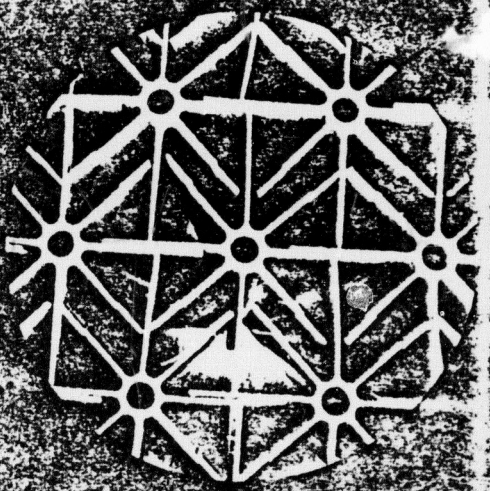
AIRCO Annual Report for Nineteen Seventy-Three

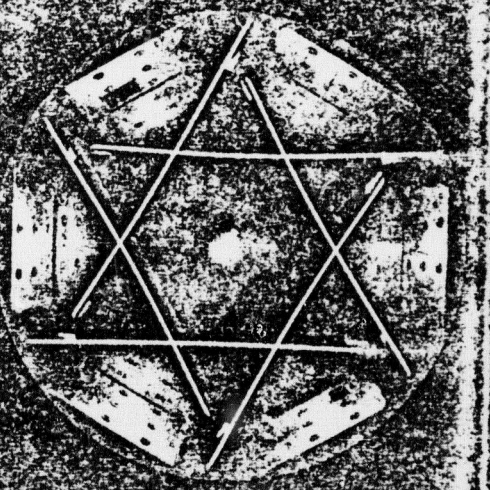
A 5275

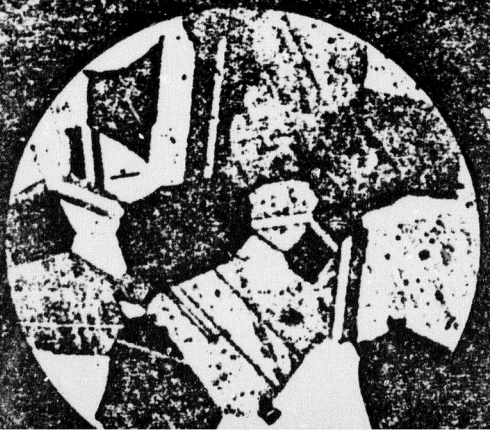












Patterns for Growth

The front cover macrophotograph (five times magnification) of ferrochrome—one of our major alloy products—and the other ten circular "pattern" photos reproduced here and repeated and identified in the respective divisional review sections (pages 4 to 33), symbolize the major businesses of Airco. The alloy photo was selected for the cover because it visually expresses our strong companywide association with metalworking and metals producing industries. Every Airco division is either a leading manufacturer of commodities for the production or fabrication of metals and/or uses large quantities of metal components in its manufacturing processes. The key "metallic" business areas contributing to Airco's record sales growth in 1973 included: *ferroalloys* for adding special properties to steels; *oxygen* and *nitrogen* for producing steels; *welding and cutting equipment* for fabricating metals; *graphite electrodes* for electric steelmaking; *electron-beam systems* for vaporizing metals; plus our own lines of metal *forgings and extrusions* and *specialty steels*. Although not directly serving the metalworking industry, Airco's *medical and cryogenic equipment*, as well as *electronic components* incorporate a wide variety of metals and alloys in their manufacture.

AIRCO, Inc.

Executive Offices:
85 Chestnut Ridge Road
Montvale, New Jersey 07645
Telephone: (201) 573-0800

A 5276

Highlights

	1973	1972	Percent Change
Sales (1)	$583,811,000	$492,295,000	+ 18.6%
Depreciation and Amortization (1)	27,530,000	24,630,000	+ 11.8%
Income Before Taxes (1)	29,360,000	27,200,000	+ 7.9%
Income From Continuing Operations (2)	19,111,000	17,944,000	+ 6.5%
Net Income	19,111,000	2,021,000	
Income Per Share From Continuing Operations (2)	1.66	1.53	+ 8.5%
Net Income Per Share	1.66	17	
Dividends Paid Per Share	.80	.80	
Working Capital	174,028,000	173,762,000	+ 0.2%
Working Capital Ratio	3.3	2.9	+ 14.8%
Research and Development Expenditures (1)	9,028,000	6,756,000	+ 33.6%
Facility Additions:			
Capital Expenditures	28,800,000	40,500,000	
Leased Facilities	7,500,000	3,900,000	
Total Facility Additions	36,300,000	44,400,000	— 18.2%
Total Assets (less applicable reserves)	590,231,000	607,430,000	— 2.8%
Stockholders' Equity	266,077,000	262,439,000	+ 1.4%
Book Value Per Share	23.49	22.31	+ 5.3%
Shares of Common Stock Outstanding at End of Year	11,324,730	11,765,233	— 3.7%
Number of Stockholders at End of Year	42,789	42,169	+ 1.5%
Number of Employees at End of Year	13,854	13,085	+ 5.9%

(1) Continuing Operations.

(2) Computed before extraordinary charge to income in 1972 of $16,000,000 or $1.37 per share and before income from discontinued operations of $77,000 or $.01 per share in 1972 (see "Financial Review," page 43).

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Corporate Data

GENERAL COUNSEL
Shearman & Sterling
53 Wall Street
New York, N.Y. 10005

AUDITORS
Haskins & Sells
2 Broadway
New York, N.Y. 10004

TRANSFER AGENT
First National City Bank
111 Wall Street
New York, N.Y. 10005

REGISTRAR OF STOCK
Morgan Guaranty Trust Company of New York
23 Wall Street
New York, N.Y. 10005

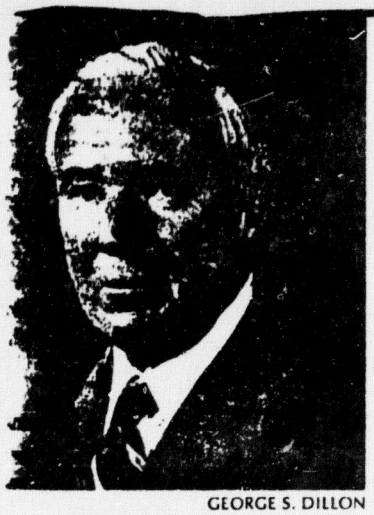
STOCK LISTING
New York Stock Exchange

TICKER SYMBOL AN

Annual Meeting

Airco stockholders are cordially invited to attend the 1974 Annual Meeting at 10 A.M. on Wednesday, April 24, 1974. The Meeting will be held at a new location: Ramada Inn, 100 Chestnut Ridge Road, Montvale, New Jersey, directly opposite Airco's corporate headquarters. Formal notice of the Annual Meeting, Proxy and Proxy Statement will be mailed on or about March 25, 1974.

A copy of Airco's Annual Report to the Securities and Exchange Commission (Form 10-K) may be obtained by writing to the Director of Communications at the company's executive offices.



GEORGE S. DILLON

RICHARD V. GIORDANO

Letter To Our Stockholders

RAX 7-D

A 5277

March 7, 1974

Sales at record high Airco's net sales for 1973 were $583.8 million, an increase of 18.6 per cent over 1972 sales from continuing operations of $492.3 million.

Earnings showed modest gain Net earnings for 1973 were $19.1 million, or $1.66 per share, up 6.5 per cent, compared with earnings of $17.9 million, or $1.53 per share, from continuing operations in 1972.

Several divisions achieved outstanding results Among the Airco businesses that operated at high levels of performance during 1973 were carbon-graphite, welding equipment, medical products, electron-beam equipment and electronic components.

The low prices and high costs that adversely affected the performance of our ferroalloys business in 1972 were corrected during the second quarter of 1973. The earnings from this business line improved significantly in the third and fourth quarters. This turnaround in the last half, coupled with the improvement shown by the businesses noted above, made possible the 6.5 per cent increase in 1973 earnings over 1972. The sales and earnings performances for each of Airco's major lines of business are covered in the "Division Reviews" section (pages 4 to 33 in this Report) and are summarized in chart form on page 37.

Spent $36.3 million for facility additions 1973 expenditures for facility additions amounted to $36.3 million, compared with $44.4 million the previous year.

Short- and long-term debt significantly reduced During 1973, we completely repaid our domestic short-term debt of $13.0 million. Reduction of our long-term debt from $177.3 million to $167.1 million, as well as current installment payments, resulted in a decrease of $22.0 million in our total debt. In May, we borrowed $6.6 million through the issuance of Industrial Revenue Bonds to cover air pollution abatement equipment for our alloys plant in Charleston, South Carolina. Also during the year, intensive working capital control programs reduced inventories $27.7 million and held the increase in customer accounts receivable to $10.7 million, although sales increased $91.5 million.

During the year, 610,700 shares of Airco common stock were repurchased at an average price of $13.48 per share, and 170,197 shares were used for acquisitions and for distribution under the company's Employee Stock Purchase Plan. At year-end, 444,009 treasury shares were on hand, and there remained authorizations to purchase 379,300 additional shares.

Research and development spending rose significantly Expenditures for research and development were $9.0 million in 1973, compared with $6.8 million the previous year. During the year, our research efforts continued to be directed toward satisfying specific divisional needs, principally in anesthetics, vacuum technology and food freezing.

British Oxygen acquires Airco shares In December 1973, British Oxygen Company (BOC) acquired 4.0 million shares of Airco common stock as the result of a tender offer at $20 per share.

A 5278

RAX 7-E

In January 1974, the Airco Board of Directors was enlarged from 12 to 16 members to provide BOC with appropriate representation. These four BOC representatives are listed, along with the other Airco directors, on the inside back cover of this Report. BOC, in turn, is expanding its Board from 9 to 11 members, with a view to including two Airco representatives (Messrs. Dillon and Giordano) on its Board.

BOC will have a significant voice in policy formulation through its representation on the Airco Board. However, major policy decisions will require approval by a majority of the 16-member Airco Board, which will continue to operate Airco's businesses in the best interests of all of our stockholders.

Late in February 1974, the Federal Trade Commission (FTC) started a proceeding in which it is seeking to force the divestiture by BOC of the 4.0 million Airco shares it has acquired.

Key organization changes strengthened senior management During 1973, the following organization changes were made: In early March, Ben W. Badenoch was appointed President of the Temescal Division; on December 1, 1973, Donald Reich, who had been Vice President-Finance, was elected corporate Senior Vice President; David J. Craig, a corporate Group Vice President, assumed additional responsibilities as President of Airco's Industrial Gases Division; Donald B. Bussewitz, who had been Controller, was elected Vice President-Controller; Lawrence W. Kunkler, formerly President of the Welding Products Division, was appointed President of our Alloys Division; and B. Joseph Werner, previously Vice President-Marketing for the Welding Products Division, was named its President.

John A. Hill, former Chairman, passed away It is with great regret and an abiding sense of loss that we report the death (last December) of John A. Hill. Mr. Hill joined Airco in 1939, and served successively as Secretary, Vice President, President, Chairman of the Board and Chairman of the Executive Committee. We shall all miss his great personal charm, wit and unflagging enthusiasm, which stimulated and inspired business associates and friends alike.

Outlook for 1974 We are pleased to report we have achieved very encouraging sales and earnings results through the first two months of 1974 and, very likely, we will have a strong first quarter. However, the host of current political and economic uncertainties make it imprudent to forecast results beyond the first three months.

Once again, we wish to acknowledge and express our appreciation for the continued cooperation, extra effort and many achievements of our nearly 14,000 employees. We also wish to thank our stockholders, distributors and customers for their encouragement and support in 1973.

President *Chairman*

A 5279

Airco Welding Products Division

Products
Oxyacetylene, oxy-MAPP, arc welding and inert gas-shielded arc welding and cutting equipment; power sources; electrodes and wires; Jackson arc welding accessories and safety equipment; cylinder gases and gas regulators; Aronson positioners, turning rolls, vibratory stress-relieving equipment.

Plants
Arcade, N.Y.;
Belmont (Grand Rapids), Mich.;
Chester, W. Va.; Chicago, Ill.;
Cleveland, Ohio;
Sparrows Point, Md.; Union, N.J.;
Warren, Mich.:
26 acetylene generating plants.

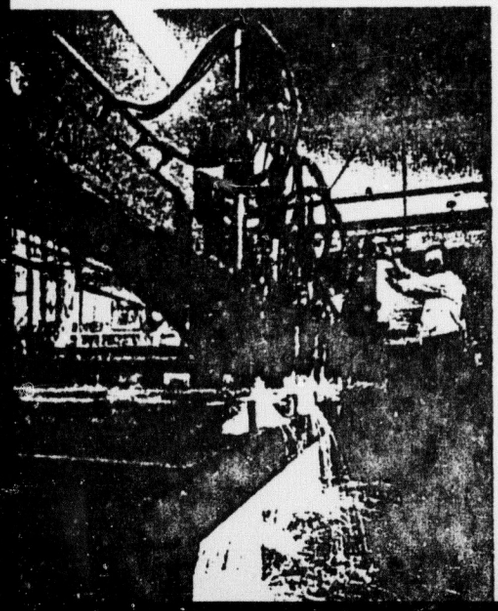
Markets
Machinery and appliances, railroad and shipbuilding, metal fabricating, automotive, iron and steel, electrical equipment and electronics, aircraft and aerospace, Federal Government. These markets are served mostly through a nationwide network of several hundred franchised domestic distributors and company-owned Sales & Service Centers, as well as internationally by a worldwide distributor organization.

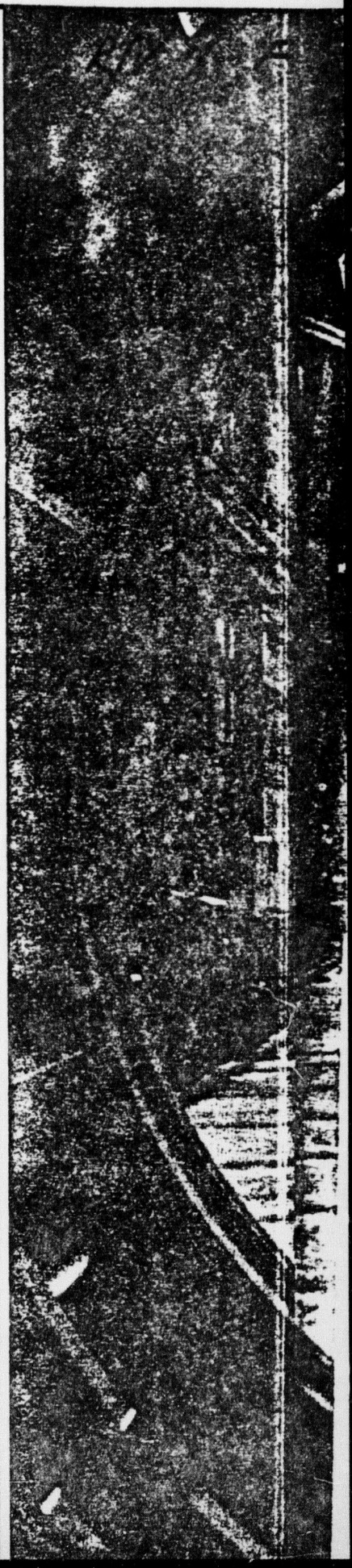
Intensive marketing effort and excellent demand for welding equipment and gases pushed sales up 22% to all-time record

A second straight year of record sales was registered by the Airco Welding Products Division in 1973. Sales surged 22 per cent over the previous year. The advance was aided by aggressive marketing efforts in a climate of peak demand for welding equipment and gases in capital and durable goods industries, expansion of international business and full-year results of recently integrated safety glass frame and welding machine manufacturing operations. Particular strength was shown in Aronson positioners, gas apparatus, power sources, welding and cutting equipment and filler metals. Jackson Products, Airco's safety products and welding accessories producer, set record sales for the fourth year in a row.

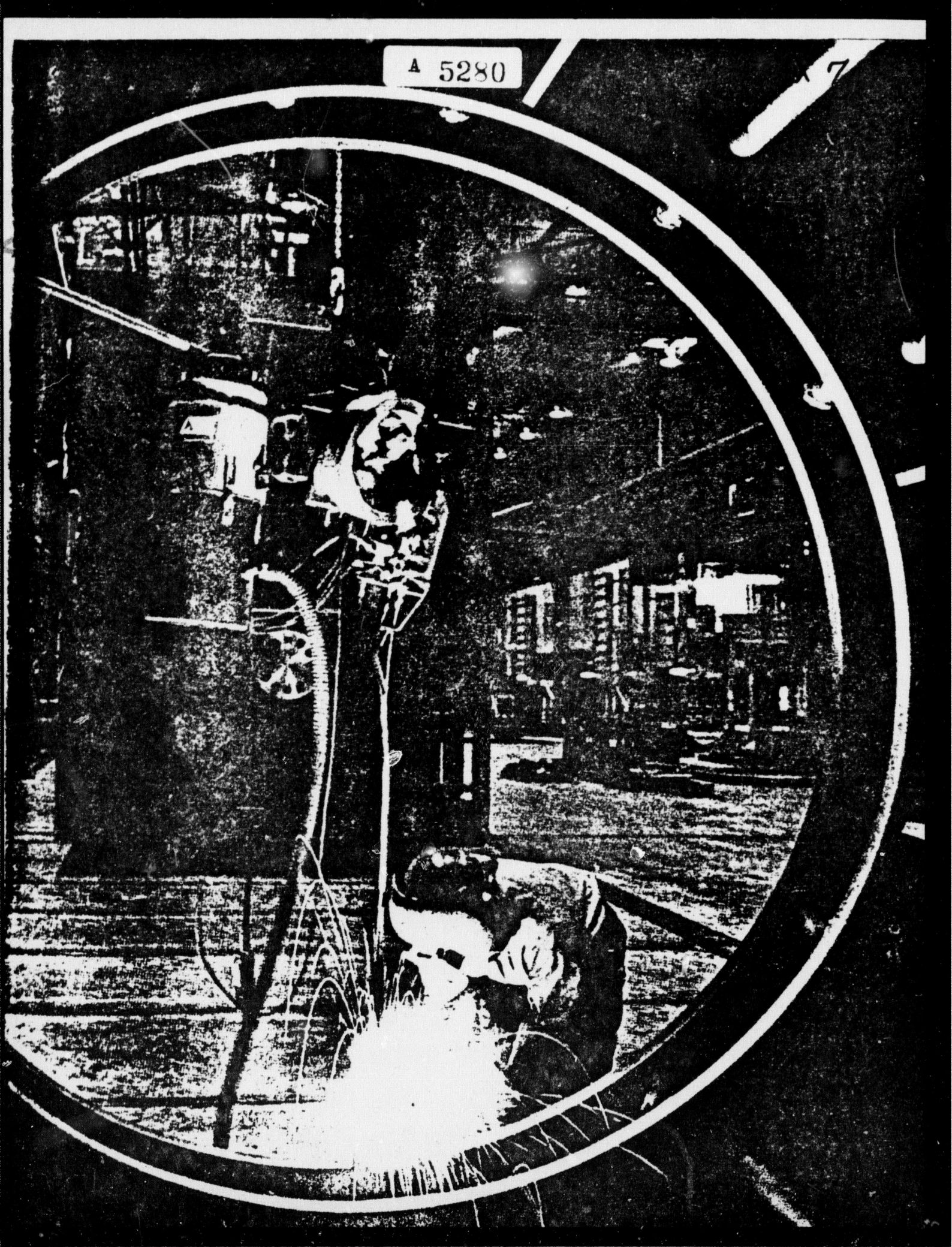
MAPP paced record year in gas sales

Impressive gains were attained in sales of atmospheric and fuel gases to establish a new record high. The advance was led by a strong performance in MAPP fuel gas, aided by Airco's continuing program to establish new MAPP distribution outlets.





Top Left: *A photomicrograph reveals the grain pattern of a sintered bronze welding rod produced by powder metallurgy techniques.*
Right: *Airco's new FCS-6 Fume Collector protects welder from smoke generated by welding arc in the fabrication of electric generators at General Electric Company in Durham, North Carolina.*
Left: *A Servograph flame cuts multiple parts for a telescoping crane at Pitman Manufacturing Co., Division of A. B. Chance Co.,*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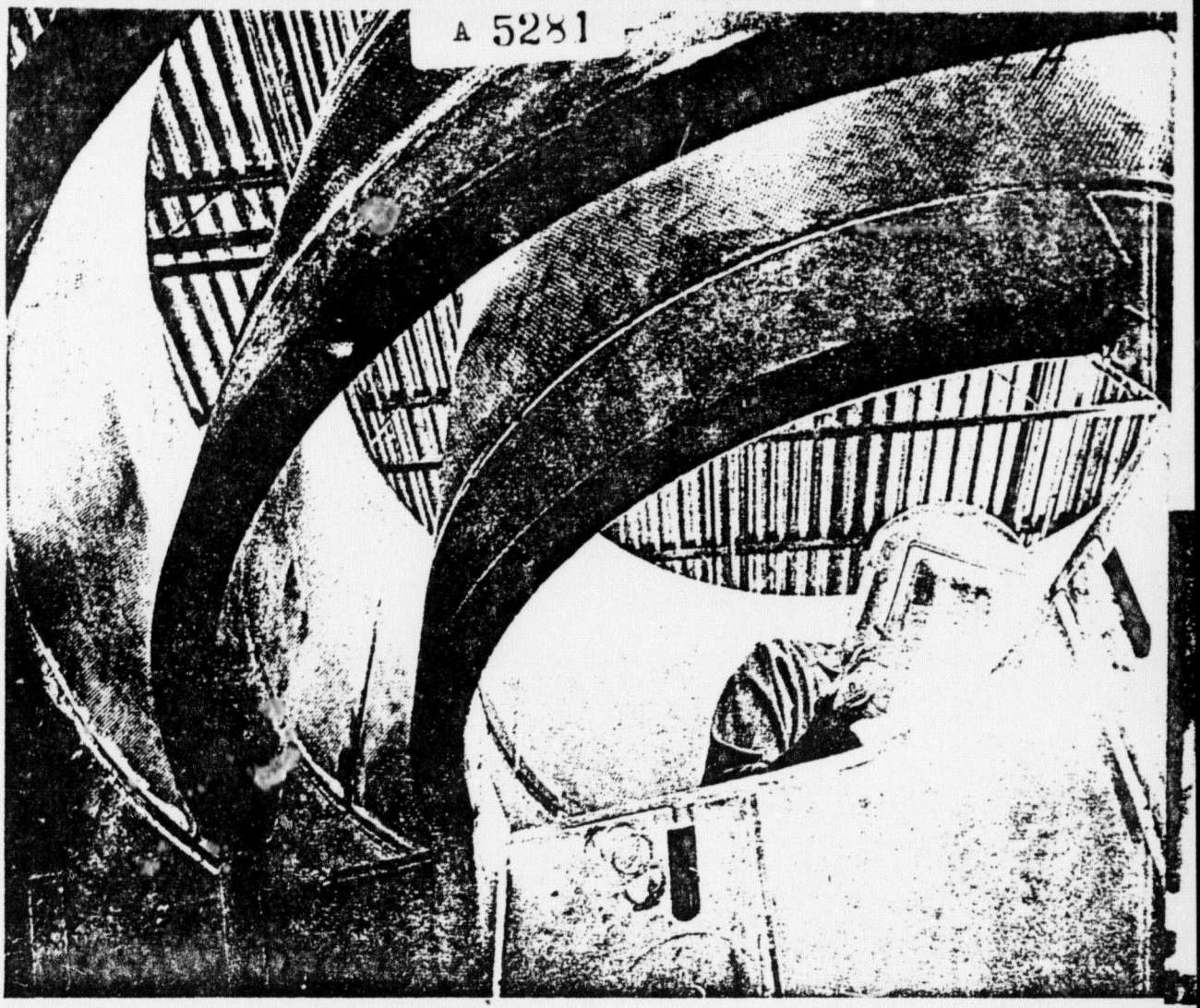

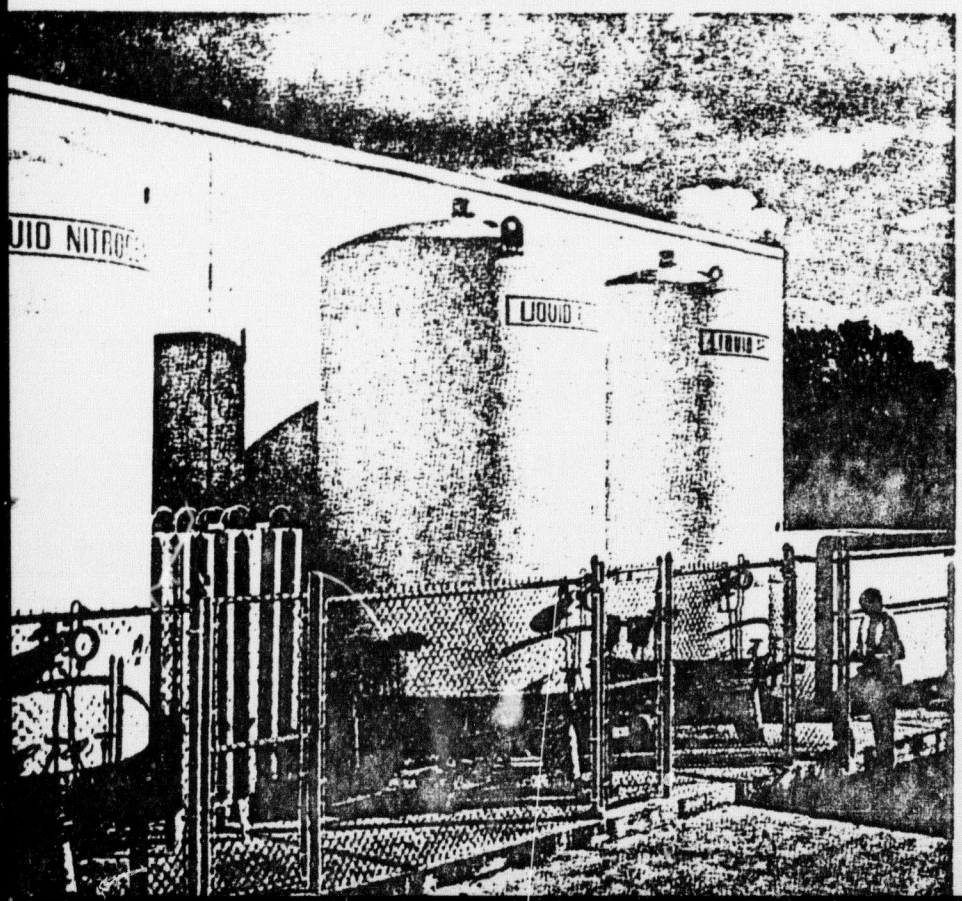

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RAX 7I

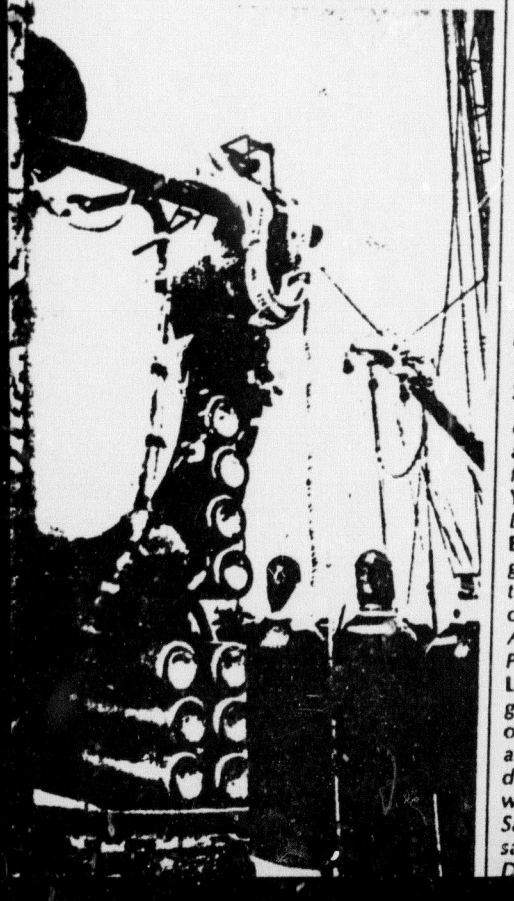
Airco
Welding Products
Division
Continued

Distributor network expanded worldwide

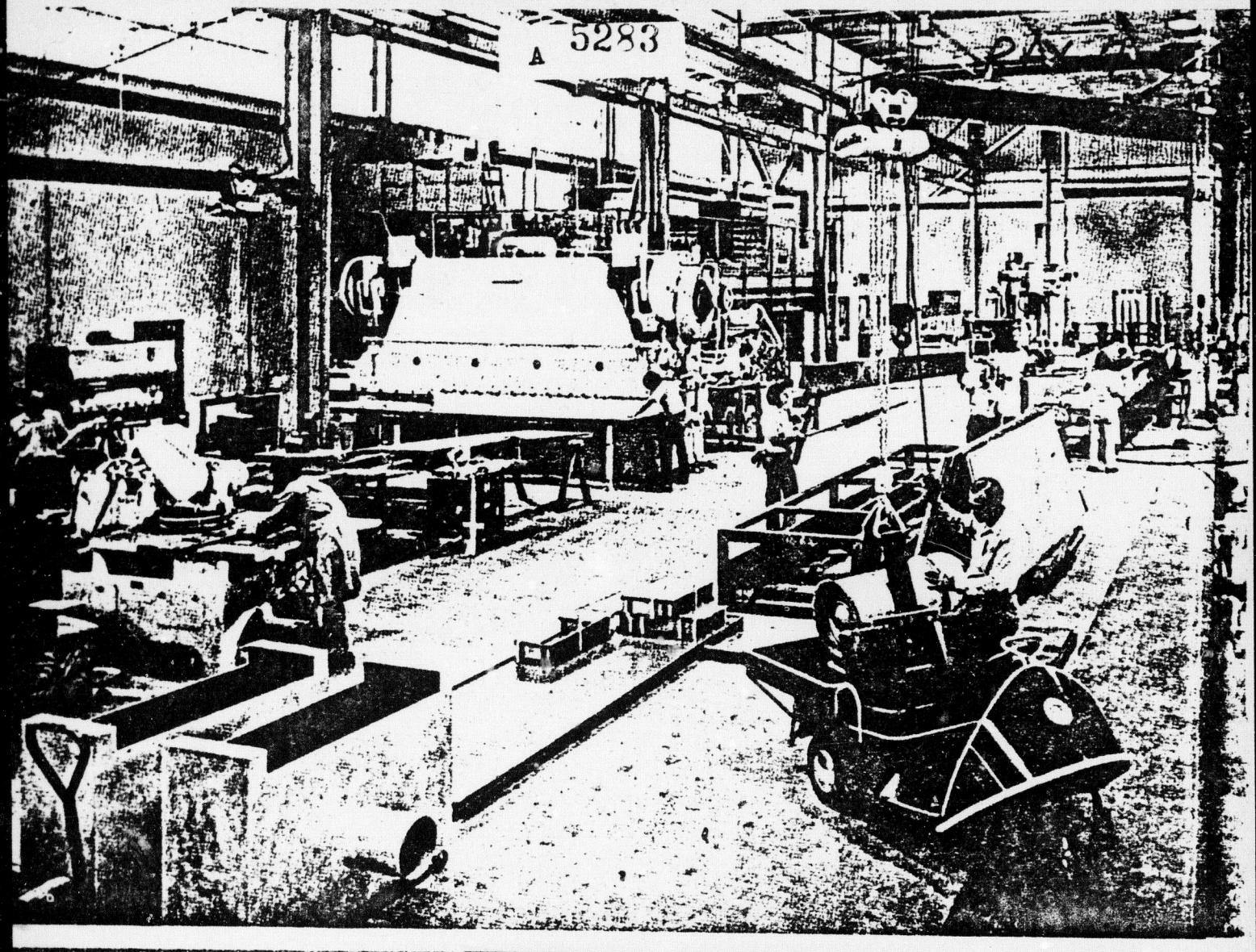
Airco's authorized distributor network again played a major role in the successful performance by the division—accounting for more than 90 per cent of total sales. The division provided strong marketing and technical support to assist distributor efforts to improve sales and increase the impact of the distributor organization. Joint Airco and distributor expansion programs resulted in the largest increase in retail outlets in the division's history. A better-than-industry sales average was attained by distributors in 1973. Airco's distributor marketing system is now the recognized leader in the welding industry. During the year, Airco expanded its program abroad and successfully established new distributor outlets in key European, African, Asian and South American markets.

Expansion of Aronson facilities launched

Work is under way to expand the Arcade, New York plant of Aronson—Airco's welding positioner manufacturing operation. The new facilities, when completed in 1974, will enable Aronson to satisfy market needs for a new line of large welding positioners.



Top Far Left: *Workman employs manual Heliweld equipment to make critical welds on a paper pulp thickener at Titanium Fabrication Corp. in Fairfield, New Jersey.*
Top Left: *The penetrating heat of MAPP gas flames speeds the automatic brazing of bicycle frames at the Brooklyn, New York plant of the Iverson Cycle Division of Stelber industries.*
Bottom Far Left: *Liquid nitrogen, oxygen and argon storage tanks at the new headquarters of Compressed Gases, Inc., Airco's authorized distributor in Pine Brook, New Jersey.*
Left: *High-purity breathing gases from Jonathan Handy Co. of New Bedford, Massachusetts, are secured to a pressurized diving chamber. The underwater home was used by Saturation Systems Inc. in salvage operations on the Andrea Doria in the Atlantic Ocean.*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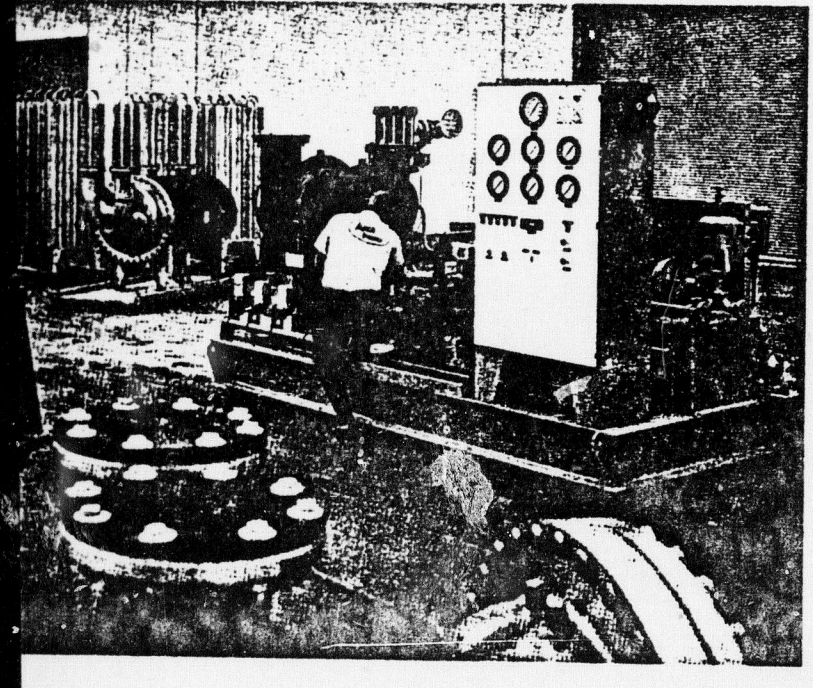

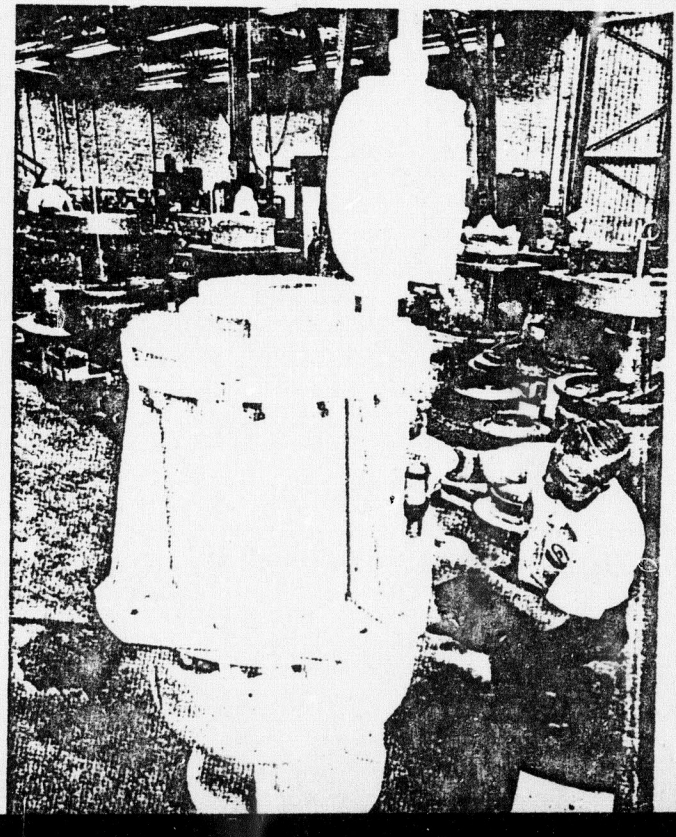

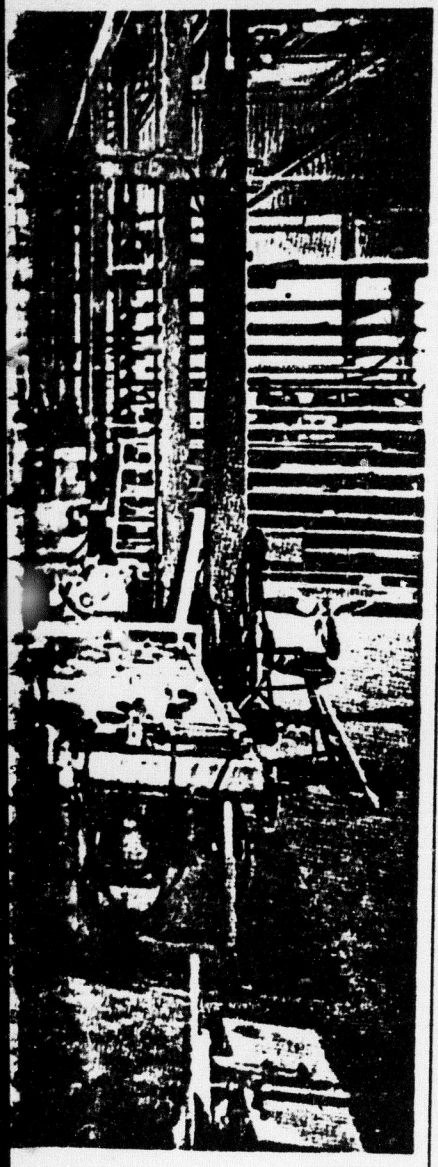

A 5284 Airco Cryogenics Division

Cryogenic equipment sales, spurred by expanded manufacturing operations, climbed 20% to a new record

The Airco Cryogenics Division registered record sales for the fourth consecutive year. Demand was particularly strong for high-pressure pumps, distribution equipment, turbocompressors and turboexpanders—used extensively by the liquefied natural gas (LNG), industrial gas and petrochemical industries.

Expanded domestic and new overseas facilities paved way for sales advance

The division enjoyed a full year's output from its expanded Irvine, California plant, where production capacity was doubled in the third quarter of 1972. Coupled with this major domestic expansion, a new European manufacturing facility, Cryostar-France S.A., was brought on-stream last September in Hesingue, France. This new plant greatly strengthened the division's overseas marketing position for a wide variety of compressors, expanders and food freezing and LNG equipment. Airco Cryogenics also operates a manufacturing plant in Basel, Switzerland, and this installation reported excellent sales growth in 1973.

Food freezing system shows great promise

During 1973, the division conducted a substantial development program for its new, high-potential food freezing system, °Kryoaire. By year-end, Airco Cryogenics completed its first major °Kryoaire installation, and had received contracts for two additional projects. The system, designed specifically for very large food freezing operations, works on the principle of recirculating air at cryogenic temperatures and does not require an expendable refrigerant.

Top Right: *Close-up of vaporizer fins (prior to assembly) inside heat exchanger for converting liquid oxygen or nitrogen to a gaseous state.*
Top Left: *Food freezing equipment being fabricated in new high-bay wing of division's Irvine, California plant.*
Far Left: *Hot gas compressor receives final inspection before shipment to Aerojet-General Corporation's Chemico Division.*
Left: *A submersible cryogenic pump, built for Shell Chemical Company, under low temperature test.*

PAX 7 K

Products
Cryogenic and mechanical equipment; high-pressure, centrifugal and submerged-motor pumps; turbines, turbocompressors and turboexpanders; high-performance electric motors and alternators; closed-cycle refrigerators; food freezing equipment; vaporizers and heat exchangers; life support equipment; carbon dioxide pelletizers; aircraft ground support equipment.

Plants
Irvine, California;
Basel, Switzerland (Cryostar AG);
Hesingue, France (Cryostar-France S.A.)

Markets
Industrial gas, food, liquefied natural gas, aerospace, chemical, research, petrochemical, shipbuilding and airlines.

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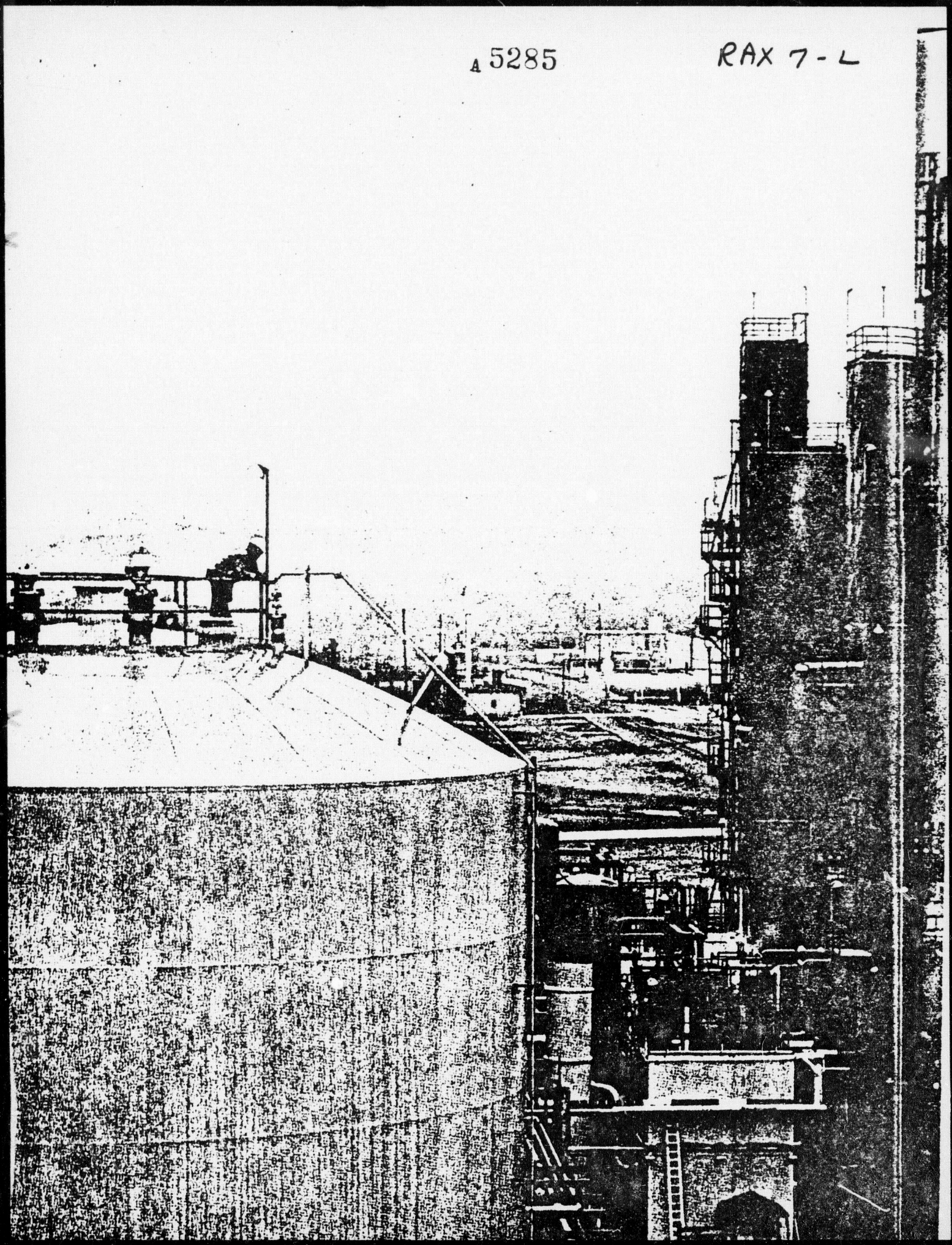
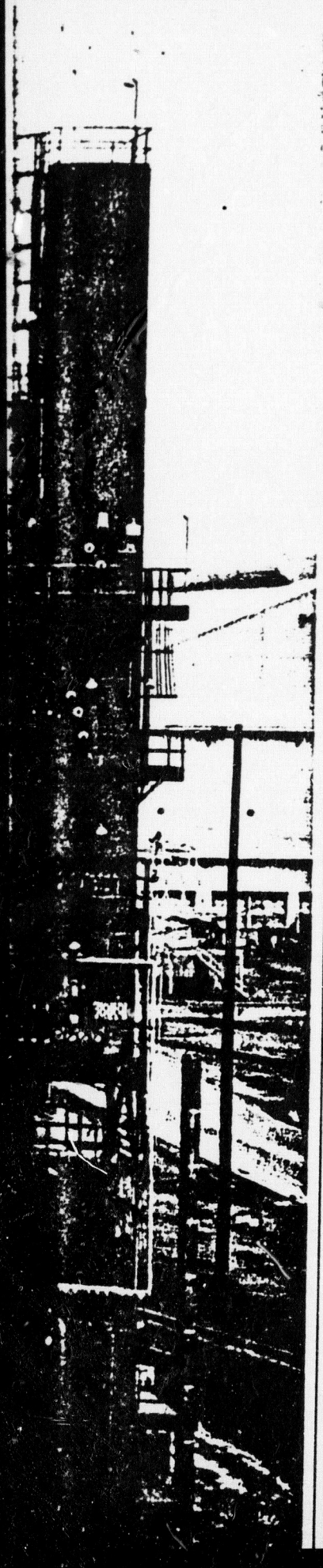
RAX 7-L





A 5286 Airco Industrial Gases Division

Overall sales declined 7% as peak demand for gases and related equipment failed to offset a reduction in LNG plant sales

Total sales for the Airco Industrial Gases Division dipped seven per cent below the near-record level established in 1972. The lower sales volume was caused by the fewer number of liquefied natural gas (LNG) plants constructed for the public utilities industry in 1973 as compared with the previous year. An outstanding sales performance was recorded in gases and related equipment. Prices for bulk-liquid merchant products firmed during the year.

New highs set in pipeline and merchant sales

Record sales were achieved for the second straight year in pipeline and bulk-liquid merchant products. Peak production was maintained throughout 1973 to keep pace with a developing tightness in the industrywide supply of bulk-liquid products. The unprecedented demand caused higher production and distribution costs. A 12 per cent sales advance reflected stepped-up usage of oxygen in the steel and grey iron foundry industries and nitrogen in the chemical, glass, food and heat treating markets. Dramatic breakthroughs in metallurgical applications, such as submerged injection of inert gas in aluminum production, pushed argon consumption to record levels. Substantial growth was shown by rare and specialty gas sales to the environmental and electronics markets.

Food industry fueled carbon dioxide growth

Carbon dioxide contributed strongly to industrial gas sales, reflecting increased demand for Airco's food freezing processes in the meat, poultry and convenience food markets. The formation of a jointly owned company in Japan to produce carbon dioxide and related food freezing equipment was

Top Right: *Carbon dioxide is useful to many businesses—in pellet form (shown), it is a key food industry refrigerant, while as a gas, it serves chemical, beverage, aerosol and metals fields.*
Left: *Oxygen from Airco's two new 400-ton-a-day plants at Fairfield, Alabama, supplies the nearby facilities of United States Steel Fairfield Works.*

RAX-7-M

Products
Oxygen, nitrogen, argon, hydrogen, helium, carbon dioxide, rare gases (krypton, neon and xenon), cryogenic fluids and related production and application equipment.

Plants
Seventeen industrial gas and cryogenic fluid, two carbon dioxide, one liquid hydrogen, one rare gases, five specialty gases, one gaseous hydrogen, five liquid helium conversion and nineteen on-site nitrogen gas plants.

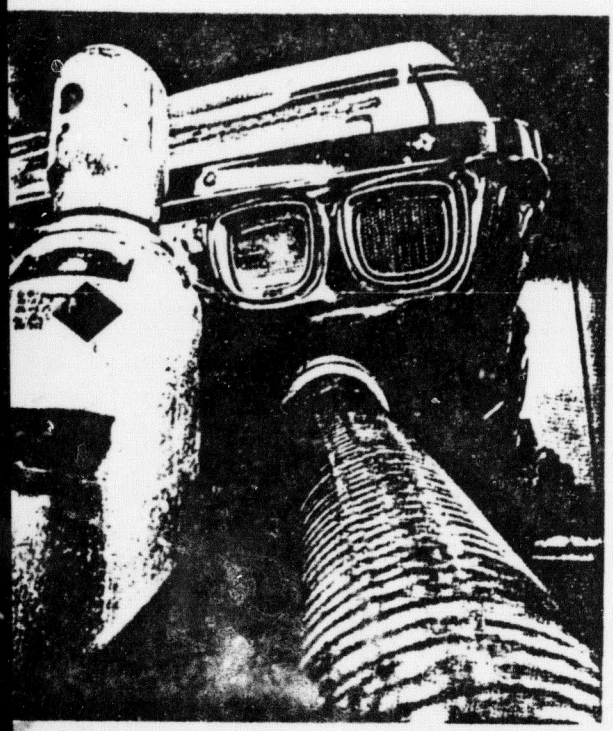
Markets
Iron and steel, nonferrous metals, cement, glass, chemical, food and beverage, electronic and electrical equipment, machinery, aerospace, metal fabricating, automotive, anti-pollution, research laboratories, Federal Government.

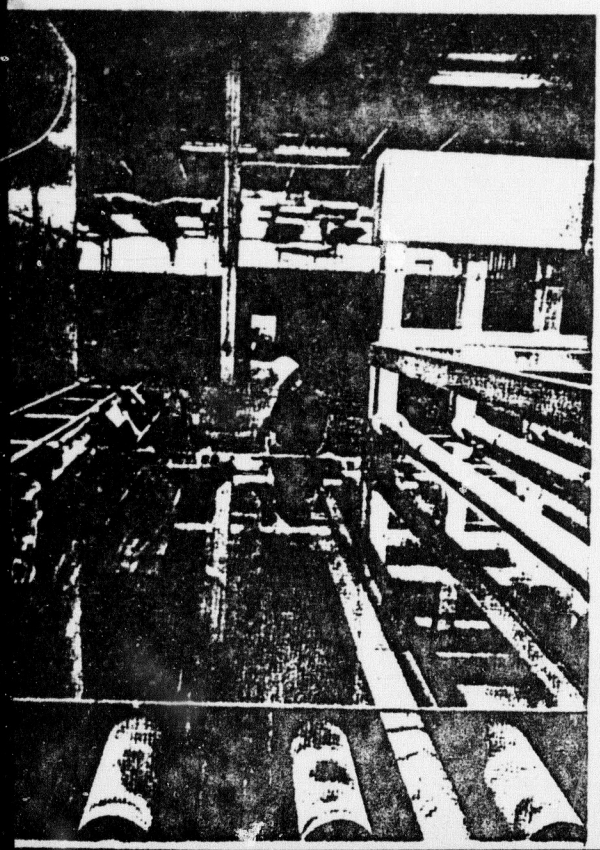
A 5287

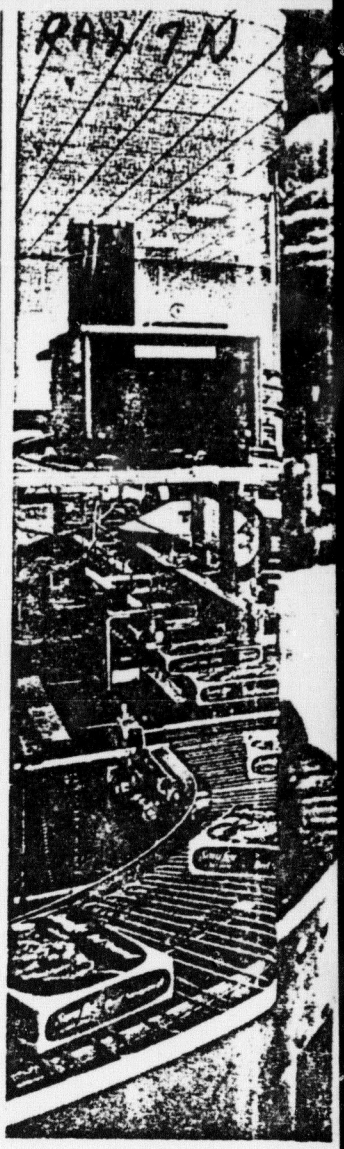
announced near year-end. The new company, International Carbon Dioxide Co., Ltd., is located in Tokyo and is owned by Airco, Nippon Sanso KK and Ekika Tansan KK.

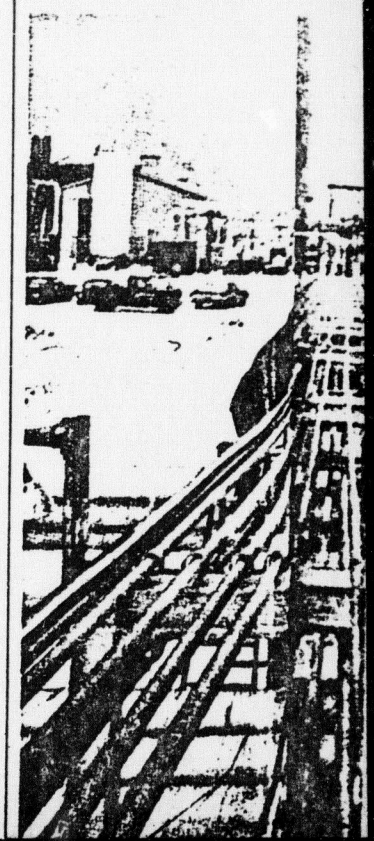
New plants placed on-stream

Plant construction activities by the Airco Cryoplants subsidiary in 1973 included completion of two 400-ton-a-day oxygen plants to serve U.S. Steel at Fairfield, Alabama, a 180-ton-a-day oxygen plant to supply Amoco Chemical Company at Decatur, Alabama, two LNG plants for major utility companies and a number of on-site nitrogen generating plants. The subsidiary also launched construction of several on-site oxygen plants for primary nonferrous metals producers, a nuclear off-gas decontamination system for a Pennsylvania power company and several on-site nitrogen plants. Engineering work is under way on a 400-ton-a-day air separation plant in the Albany, New York area.









Top Left: *Airco calibration gases are used in auto emission control testing at the General Motors assembly plant in Fremont, California.*
Left: *Float glass production at the C-E Glass Division of Combustion Engineering Corporation plant in Cinnaminson, New Jersey, is protected from impurities by nitrogen gas.*
Top Far Right: *An on-site nitrogen generating station provides blanketing atmosphere for plastics manufacturing operations at General Electric Company's Selkirk, New York plant.*
Top Right: *The world's largest KwikFreeze carbon dioxide system processes consumer and institutional frozen food items at the Kitchens of Sara Lee in New Hampton, Iowa.*
Bottom Far Right: *Argon gas protects silicon crystal growth operations from contamination at Motorola Inc.'s electronics plant in Phoenix, Arizona.*
Right: *An Airco-built liquefied natural gas plant in Astoria, New York, enables Con Edison Company to liquefy natural gas for storage.*

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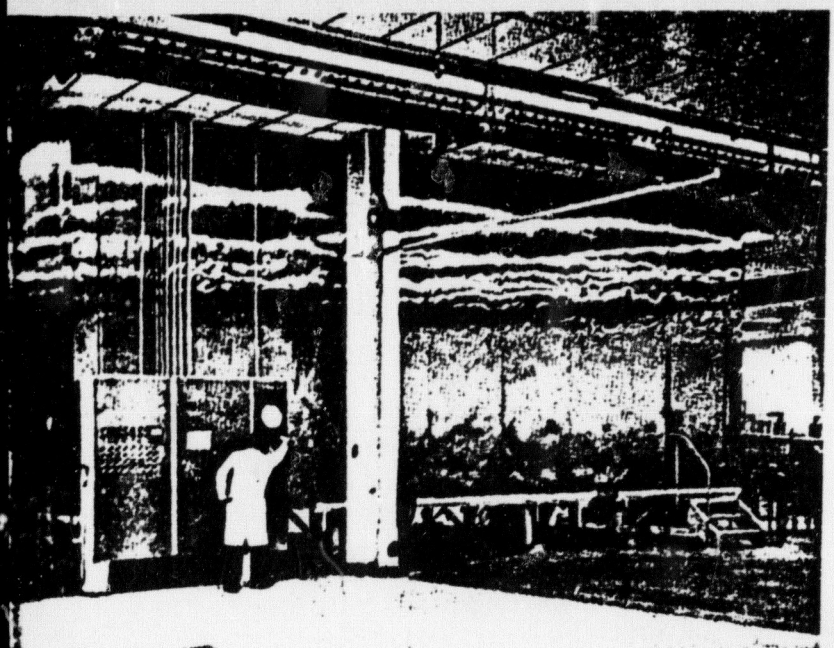

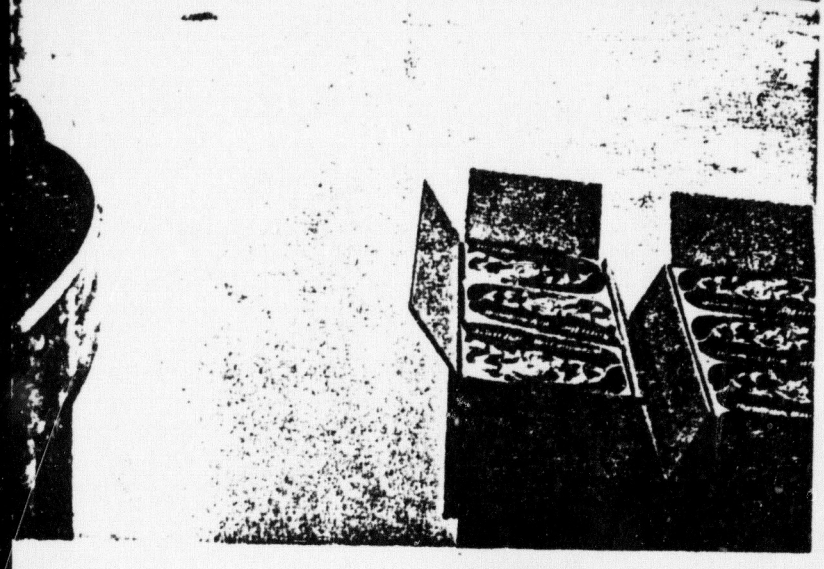

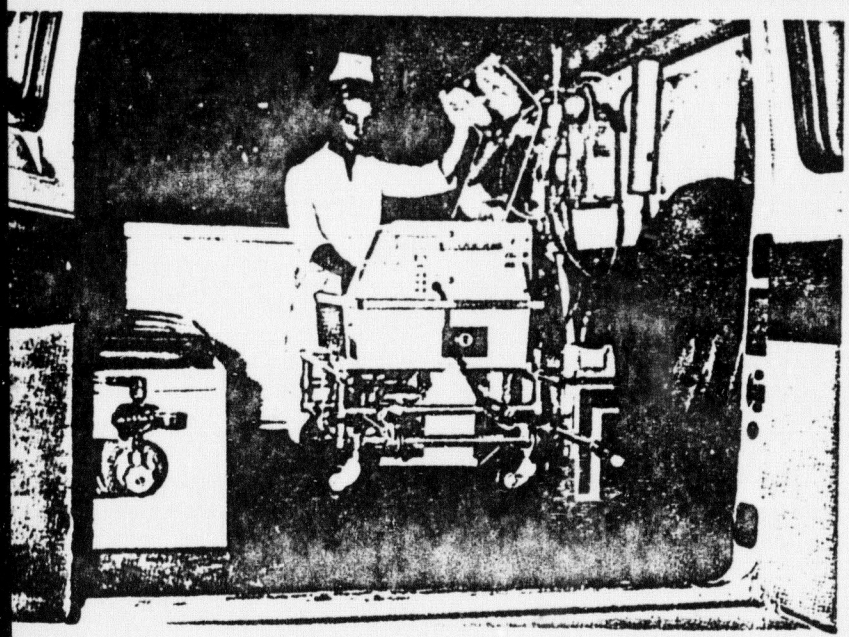

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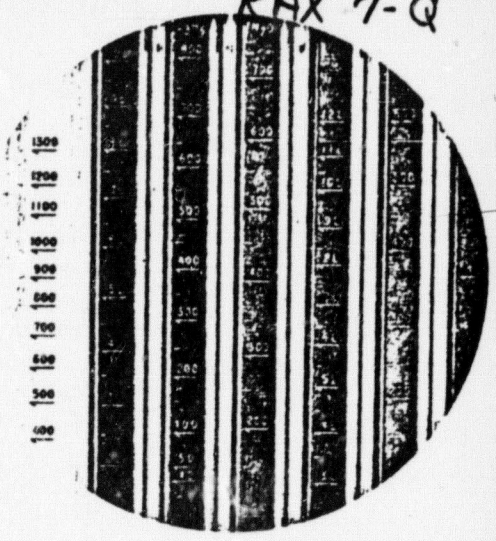
Ohio Medical Products Division

Sales, up almost 25%, hit new record; Ēthrane, new inhalation anesthetic, highly successful

The Ohio Medical Products Division had a strong year in 1973. Sales were up nearly 25 per cent with increases recorded in all major product categories. Highlighting the division's outstanding performance was the increase in sales realized from the first full year of marketing Ēthrane, its new inhalation anesthetic. Sales of Ohio Medical's traditional line of hospital equipment—such as inhalation therapy, anesthetic and pediatric units—and its expanded line of disposable products (anesthesia breathing circuits and endotracheal catheters) also contributed to the division's record success last year.

Ēthrane gains broad acceptance

In its first full year on the market, Ēthrane sales ran well ahead of forecast—reflecting widespread acceptance by the medical profession. The agent already ranks second



Products
Anesthetic agents and medical gases, anesthesia apparatus and accessories, inhalation therapy and resuscitation equipment, hospital medical gases and vacuum pipeline systems, infant incubators, respirators, cryosurgery equipment, pulmonary function testing equipment, modular wall systems for special patient care areas.

Plants
Berkeley, Calif.; Cleveland, Ohio; Fort Myers, Fla.; Houston, Tex.; Lodi, N.J.; Madison, Wis.; Richmond, Calif.; Toronto, Canada (Ohio Medical Products Canada)

Markets
Hospitals, clinics, and nursing homes; medical and dental professions.

Top Right: *Close-up view of flow tubes on an anesthesia machine.*
Top Left: *Ohio Medical's anesthesia machine, breathing circuit and gases in use at the V.A. Hospital in Madison, Wisconsin.*
Far Left: *A nurse prepares an Ohio Transport Incubator in a specially designed van for transporting newborn infants at United Hospitals of Newark in New Jersey.*
Left: *Worker packages a disposable anesthesia breathing circuit manufactured at Ohio Medical's plant in Fort Myers, Florida.*

Ohio Medical Products Division
Continued

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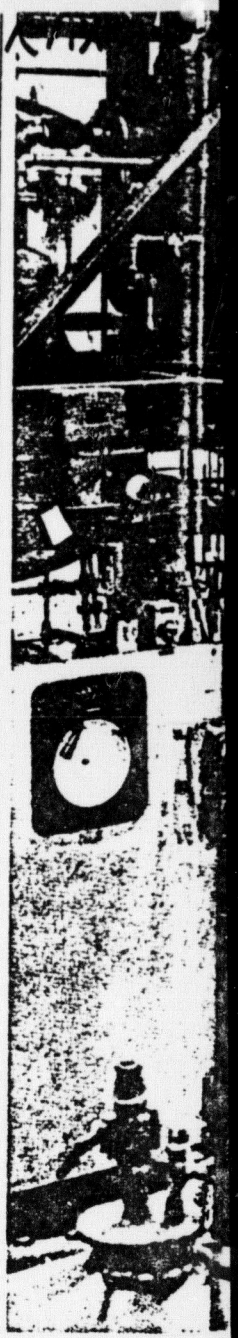
in the U.S. among the most commonly purchased inhalation and intravenous anesthetics. Abbott Universal, the international subsidiary of Abbott Laboratories licensed to make and market Ethrane outside the U.S. and Canada, also reports excellent acceptance in its foreign markets.

In recognition of the anesthetic agent's impact, *Industrial Research* magazine cited Ethrane as one of the year's 100 most significant new industrial products.

Two new products introduced

During the year, Ohio Medical introduced two new pieces of hospital equipment incorporating sophisticated fluidics circuitry. Both units have met with excellent initial success. One is the 550 Ventilator, an intermediate size, moderately priced general medical unit for assisting patients with breathing difficulties. The other is a fluidically controlled anesthetic ventilator which provides a precise method of ventilating a patient during surgery. The fluidic control modules on these ventilators have the ability to sense and respond instantly to minute pressure changes in the patient's airway.



Left: *Ohio's new 550 Ventilator in operation in the recovery room at St. Anthony Hospital Systems, Inc., Denver, Colorado.*
Top Right: *Interior view of the Cleveland, Ohio facility for the manufacture of Ethrane, Ohio Medical's highly successful inhalation anesthetic.*
Right: *Sophisticated instrumentation, such as this infrared spectrophotometer (shown in the foreground), aids in the quality control of Ethrane production.*

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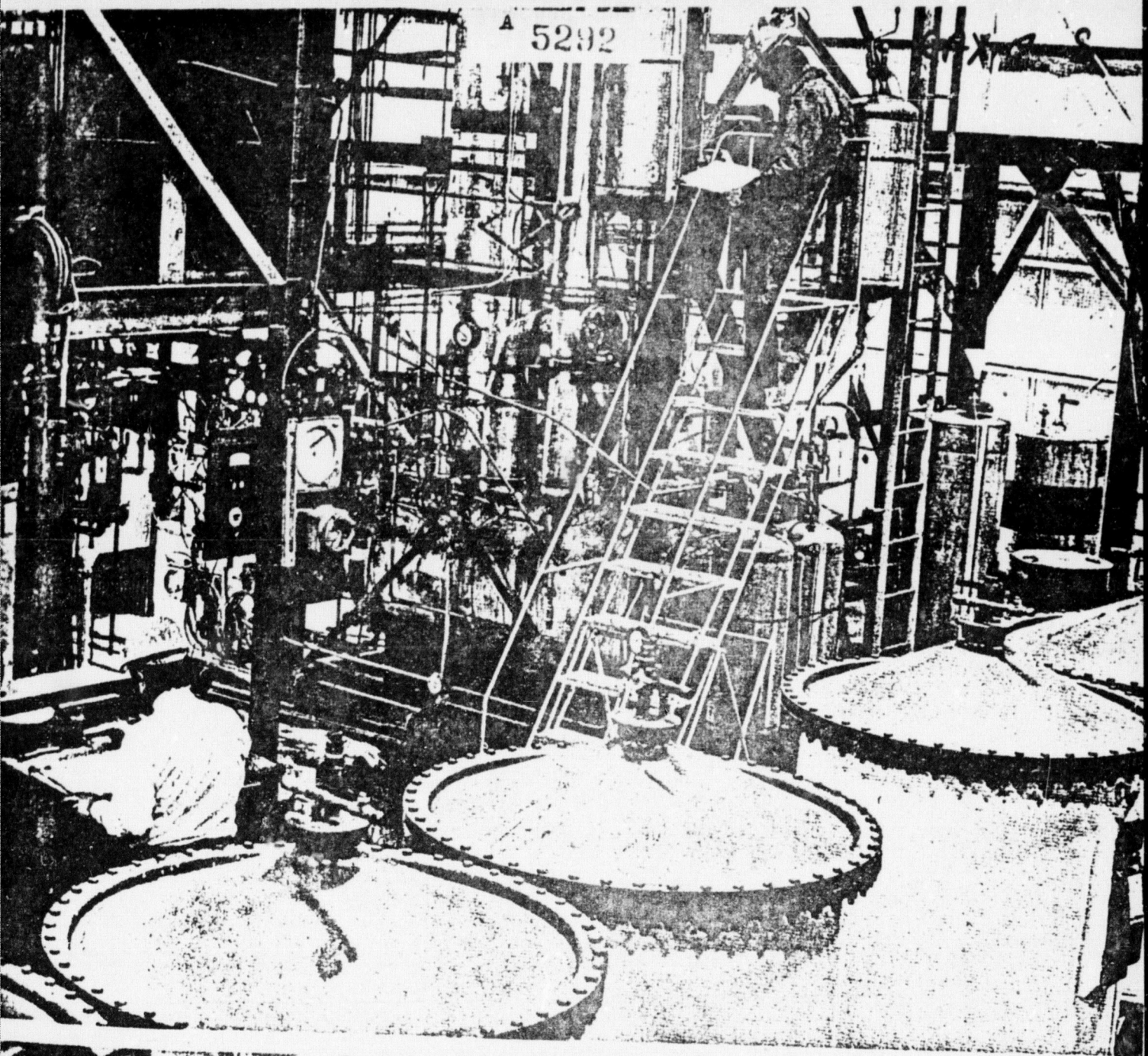

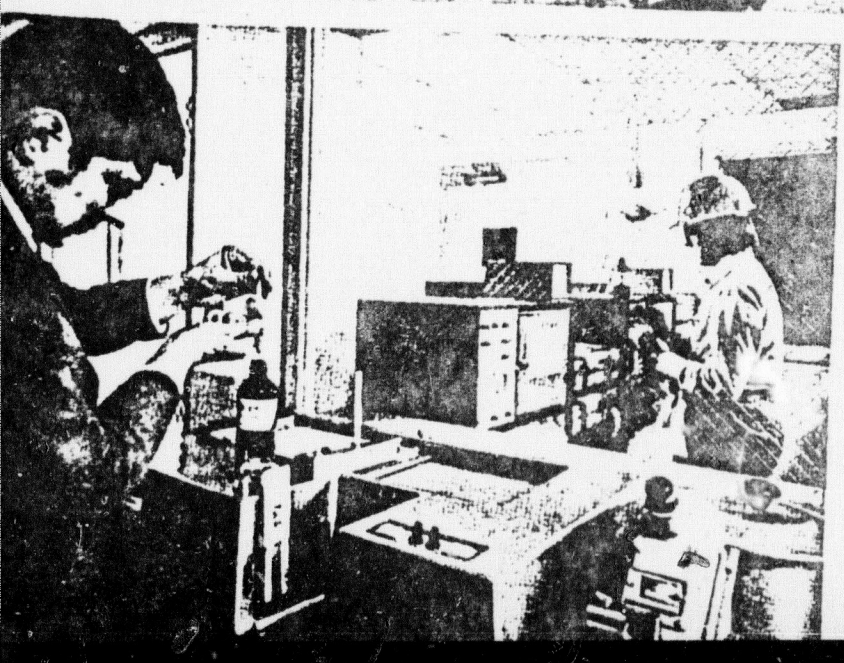

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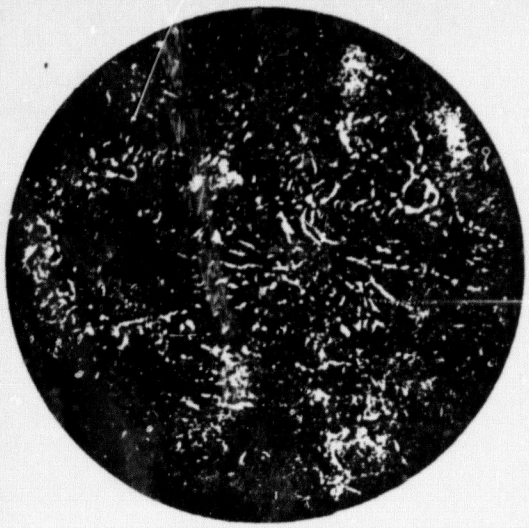


Products
Ferrochromium, ferrochrome silicon, ferrosilicon, standard ferromanganese, low-carbon and medium-carbon ferromanganese, silicomanganese, stainless steel pigs, special alloys.

Plants
Calvert City, Ky.; Charleston, S.C.; Mobile, Ala.; Niagara Falls, N.Y.; Vargon, Sweden (Airco Alloys AB).

Markets
Steel, automotive, foundry, miscellaneous metals.

Airco Alloys Division

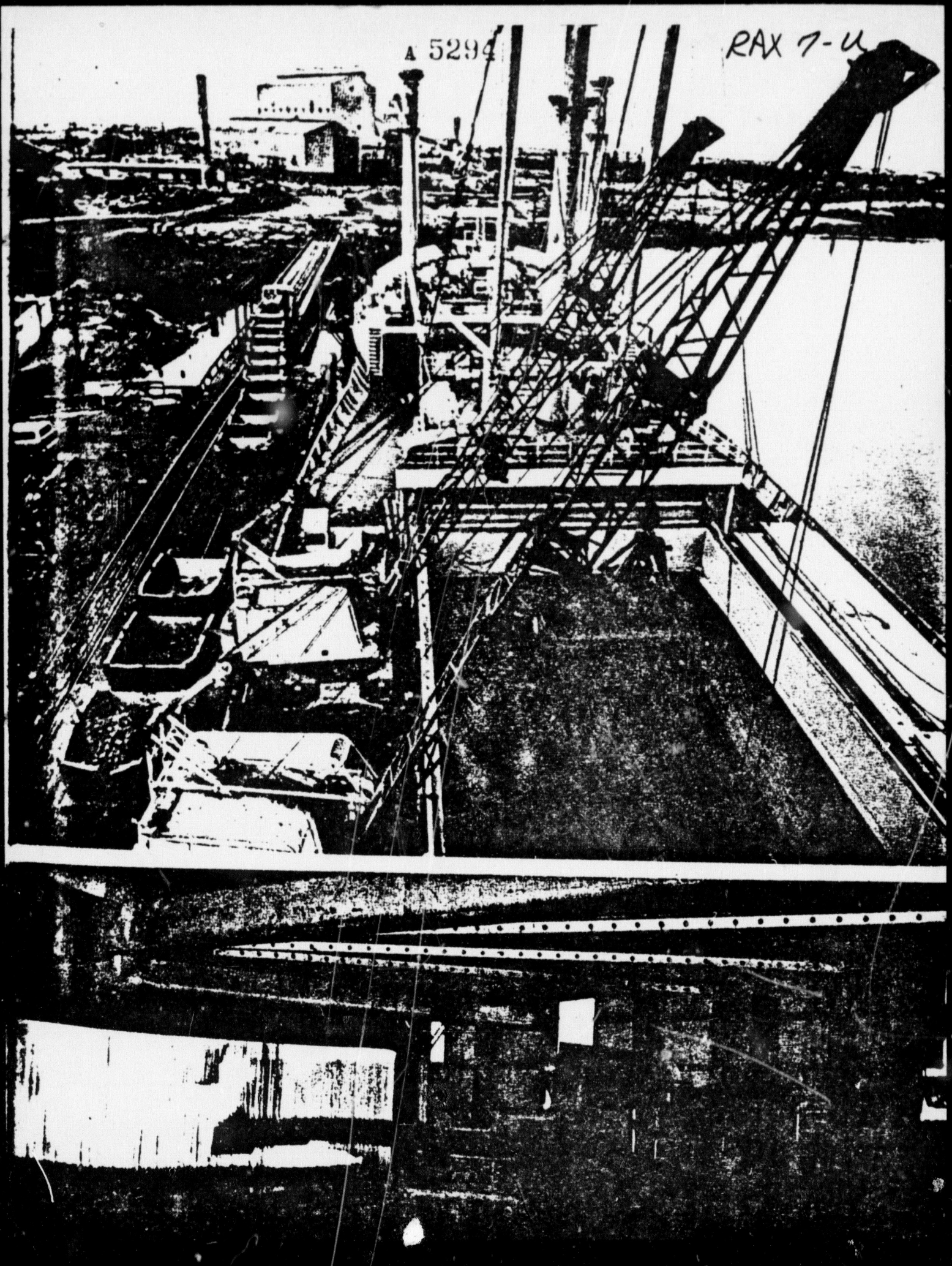
Sales increased 27%, reflecting strong product demand in U.S. and overseas markets

Sales of the Airco Alloys Division increased 27 per cent in 1973, indicating a healthy recovery from the previous year. This improved sales performance is the result of increased worldwide demand for ferroalloys, higher selling prices in the U.S. for alloy products, as well as a reduction of low-priced imports which were at unprecedented levels in 1972.

Higher prices, cost control programs aid division's performance

Domestically, sales increases were recorded in all product areas last year, due principally to strong demand for ferroalloys by the U.S. steel industry, and to price increases for silicon and chromium products instituted by the division during the first quarter before the price freeze. Manufacturing costs were also reduced despite significant price increases in the cost of power and raw

Top Left: *Close-up of molten ferroalloy in a ladle just after furnace tapping.*
Top Right: *Russian chrome ore is unloaded at the division's ferrochromium plant in Charleston, South Carolina.*
Right: *Furnace stoking is an integral part of ferroalloys manufacture.*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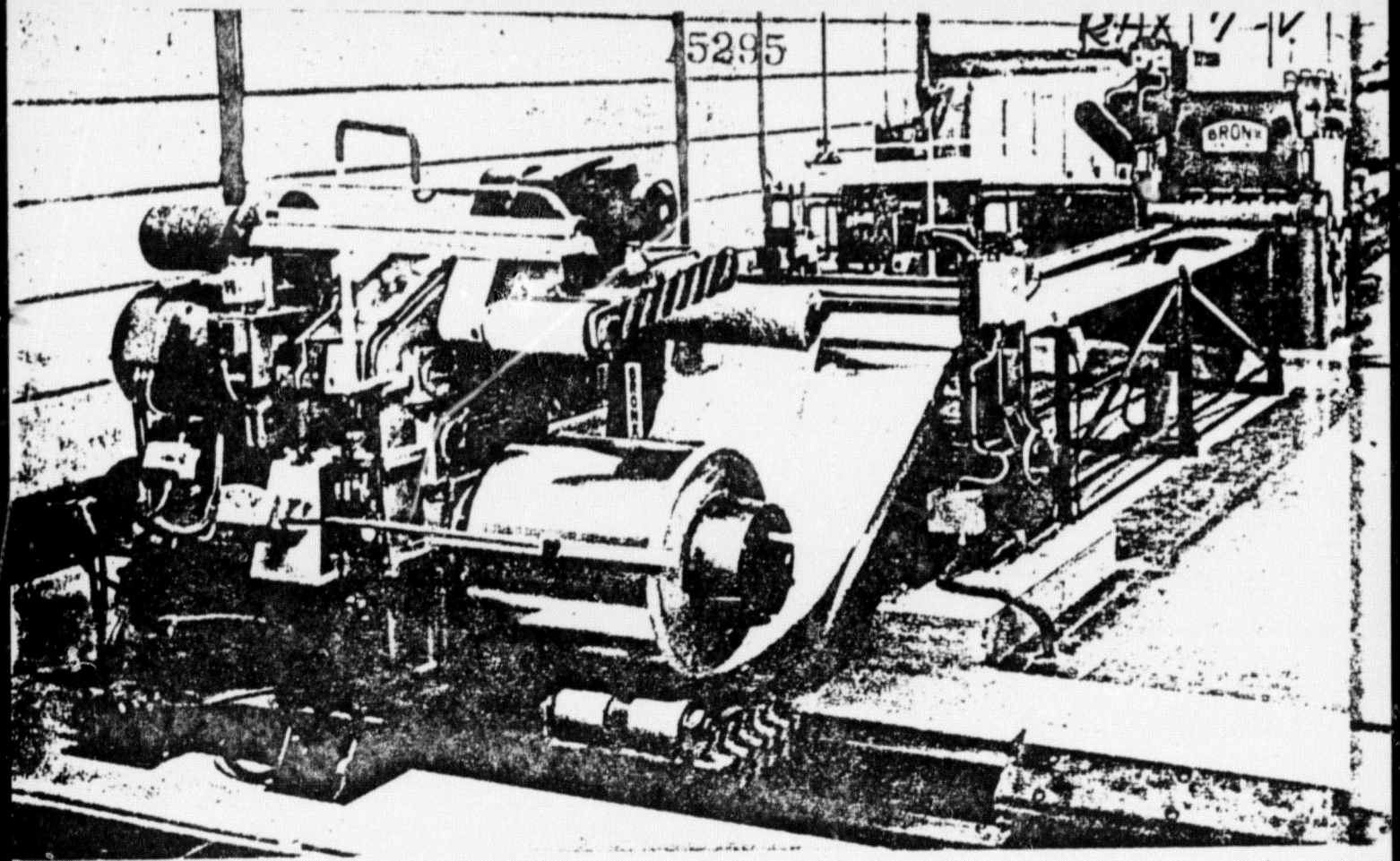
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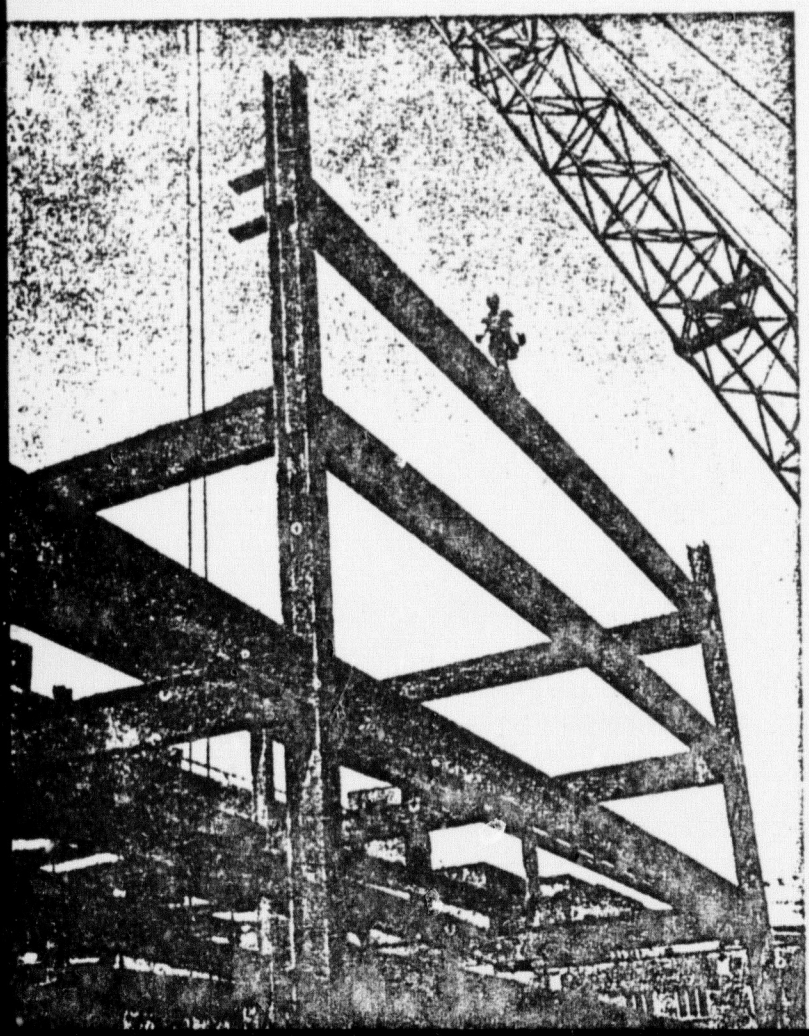

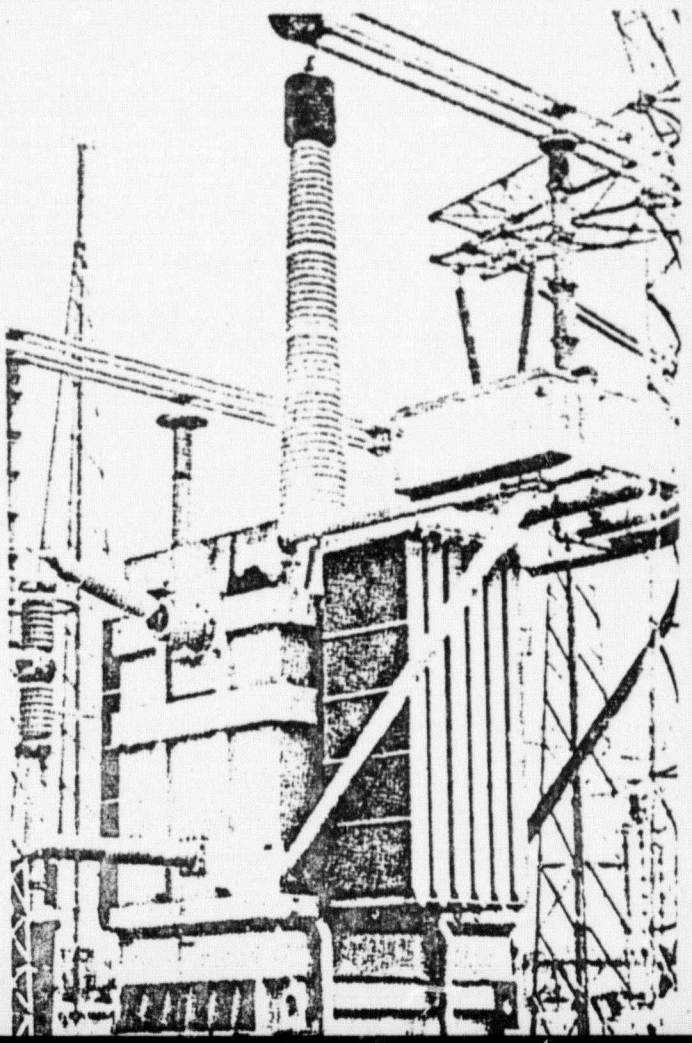

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materials. The profit turnaround began in the second quarter as the higher prices and lower manufacturing and distribution costs took effect. Overseas sales volume also increased, reflecting the first full year of operation of the new ferroalloys furnace in Vargon, Sweden. However, lower European prices offset the effects of the division's cost reduction programs there.

New pollution control projects started

In 1973, the division started construction of two baghouse filter systems to control emissions from four furnaces at its Calvert City, Kentucky plant. One of these facilities (costing more than $2 million) will be completed in June 1974, while the other larger one (a $6.8 million project) is scheduled for completion in April 1975.

Emission control programs have either been completed—or are on schedule to comply with local regulations—at the division's other manufacturing locations at Niagara Falls, New York; Charleston, South Carolina; Mobile, Alabama, and Vargon, Sweden.

Ferroalloys manufactured by Airco Alloys—such as ferrochromium, ferromanganese and ferrosilicon—add special qualities to steel. They are a major factor in making the differences in steels used for kitchen sinks, structural girders and electrical equipment.
Top: *Chrome-nickel stainless steel, containing about 18 per cent chromium, is shown on the cutting line at the Langshyttan, Sweden plant of Fagersta AB.*
Far Left: *Ferromanganese adds the strength to many of Bethlehem Steel's structural steel members, such as those for this parking garage under construction at Easton, Pennsylvania.*
Left: *Airco Alloys was the pioneer in supplying high-purity ferrosilicon for the manufacture of silicon steel, extremely necessary in the fabrication of electrical equipment like this Westinghouse Electric Corp. transformer.*

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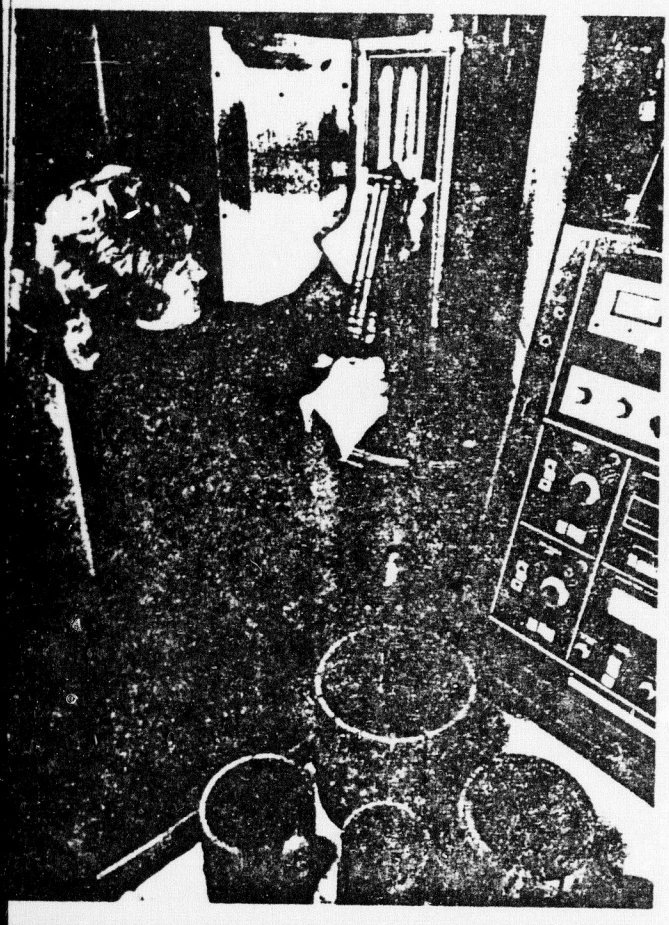

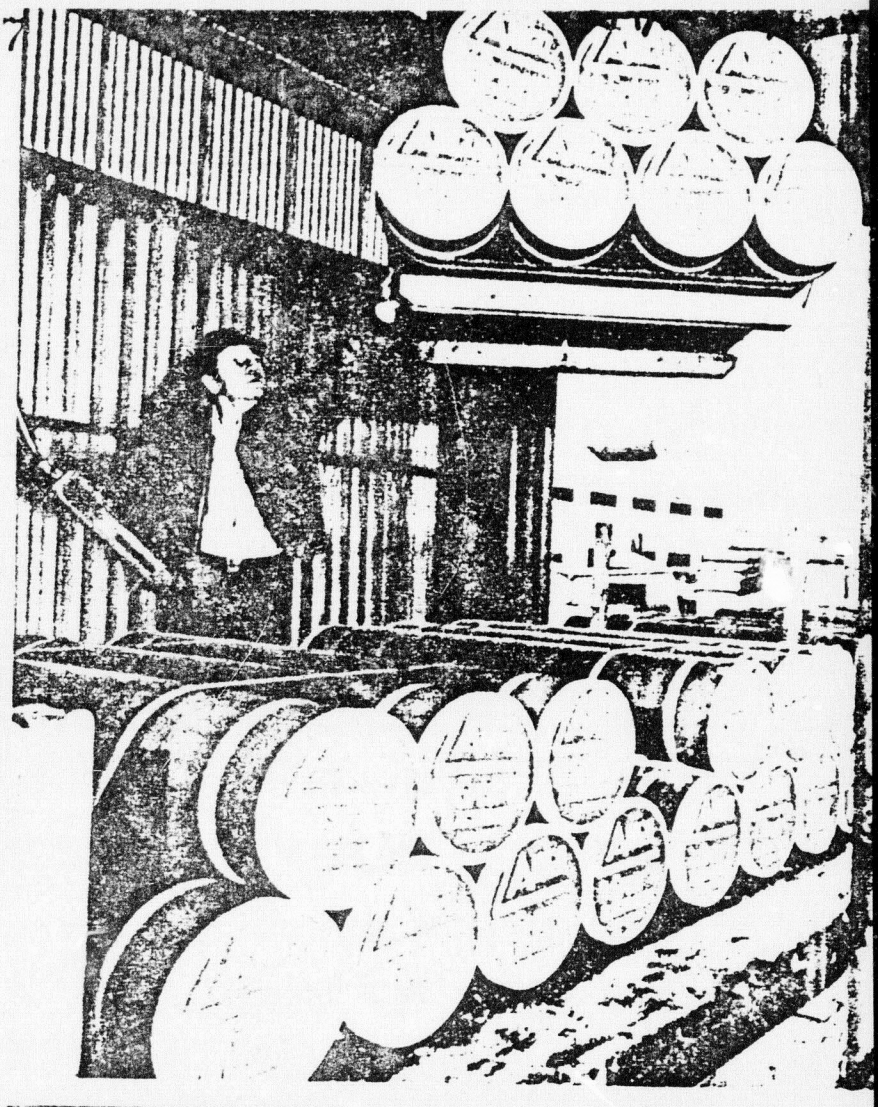

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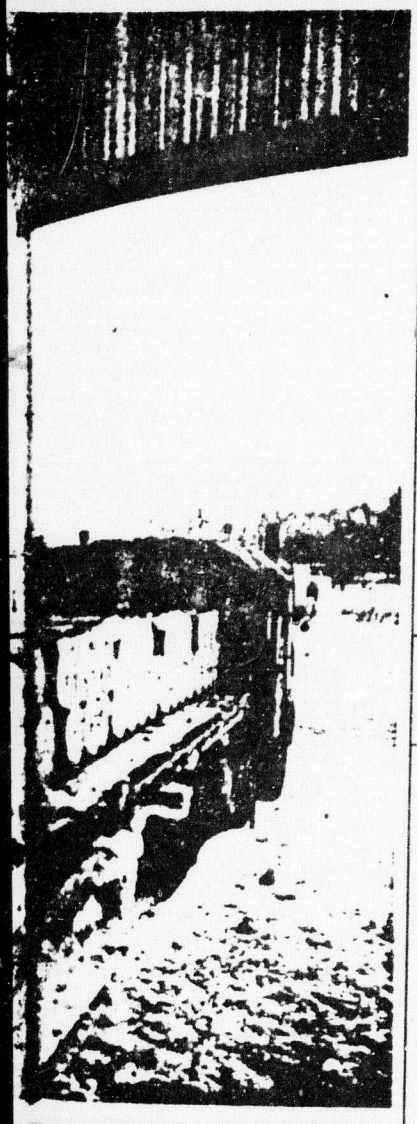

Airco Speer Carbon-Graphite Division

A 26% increase in sales set a new high for the division, as demand climbed sharply in all carbon and graphite product areas

All-time record sales were achieved by the Airco Speer Carbon-Graphite Division in 1973. Paced by a strong demand in the metals industries, sales rose 26 per cent over 1972 levels. The higher sales volumes were accompanied by improved prices, particularly in the graphite electrode market. Peak production was maintained throughout the year in every product area.

Strong gains posted in electrodes

The division's excellent performance was led by sharply increased sales of graphite electrodes to electric steel producers and steel foundries. Stepped-up anode sales reflected broadened penetration of the magnesium market. Demand for both electrodes and anodes has maintained a strong pace through the early part of 1974.

Top Right: *A photomicrograph reveals the high-strength grain structure of a premium-grade electrode for steelmaking.*
Top Far Left: *Ventron, Inc., of Bradford, Pennsylvania, uses a variety of graphite heaters to produce silicon crystals.*
Top Left: *A shipment of 14-inch electrodes is prepared at St. Marys, Pennsylvania, for delivery to a steel mill for use on an electric arc furnace.*
Bottom Far Left: *New 17-inch Kostkutter gouging rods for foundry use are inspected and packed at Punxsutawney, Pennsylvania.*
Left: *Graphite anodes are custom machined for use in electrolytic production of chlorine.*

Products
Threaded graphite electrodes for steelmaking; anodes for electrolytic production of chemicals and metals; brushes for motors and generators; electrode material for electrical discharge machining; nuclear graphites; graphite welding and gouging rods; graphite fluxing tubes; carbon battery electrodes; machined carbon and graphite molds, crucibles, fixtures and specialties; graphite rocket nozzles for ordnance projectiles.

Plants
Niagara Falls, N.Y.; Punxsutawney, Pa.; St. Marys, Pa.; Montreal, Canada (Speer Carbon Co. of Canada Ltd.)

Markets
Steel, foundry, electrochemical, nonferrous metals, electronics, refractories, automotive, railway, aircraft and aerospace, electrical machinery, machine tool and die shops, manufacturers of dry cell batteries, Federal Government.

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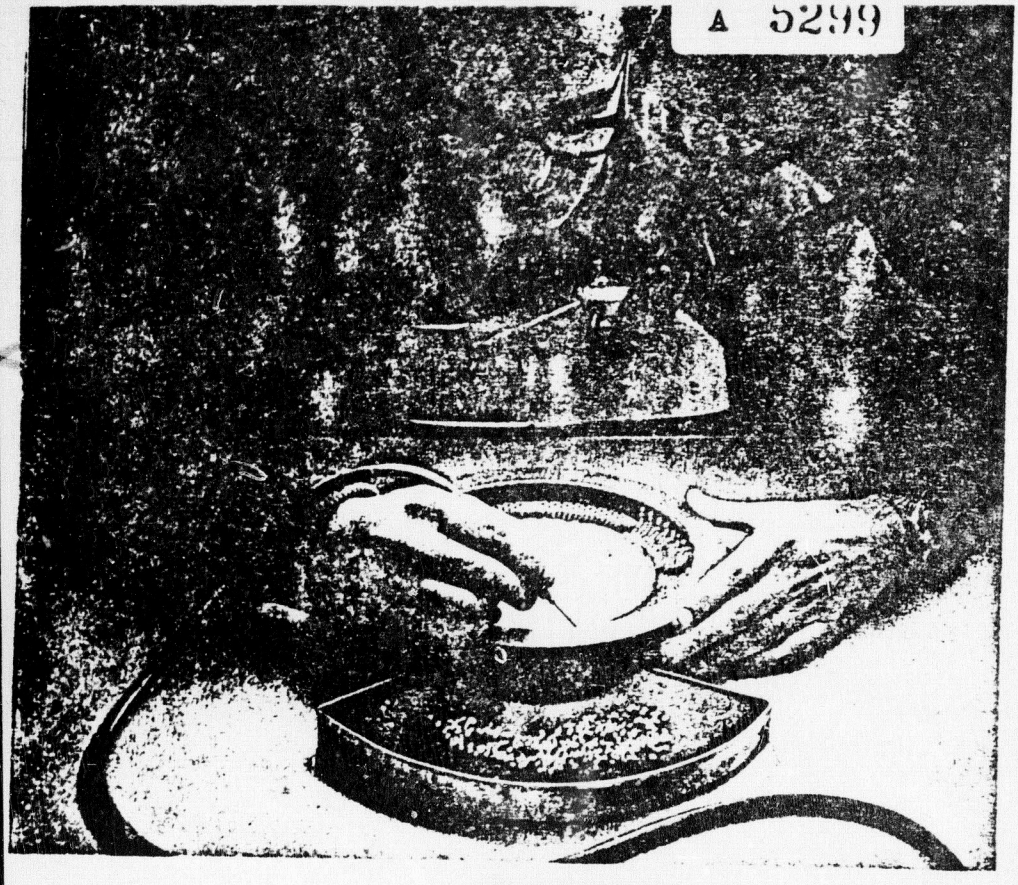

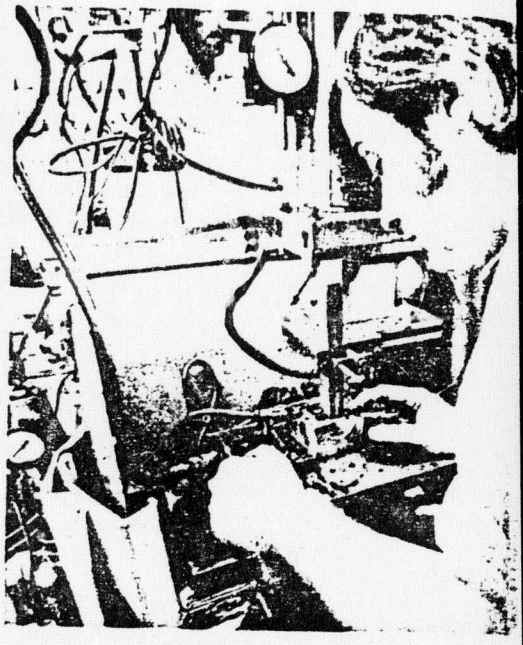

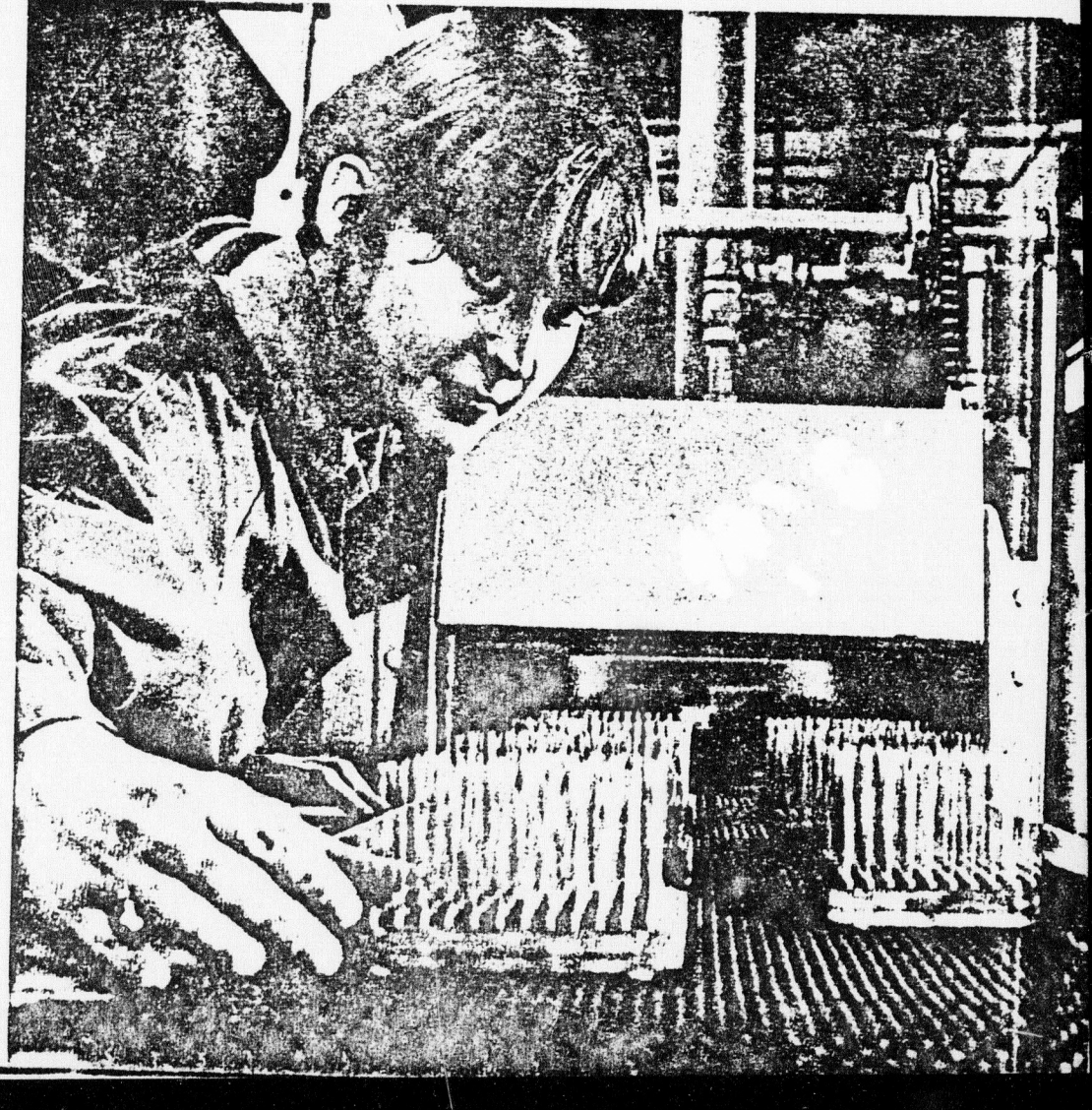

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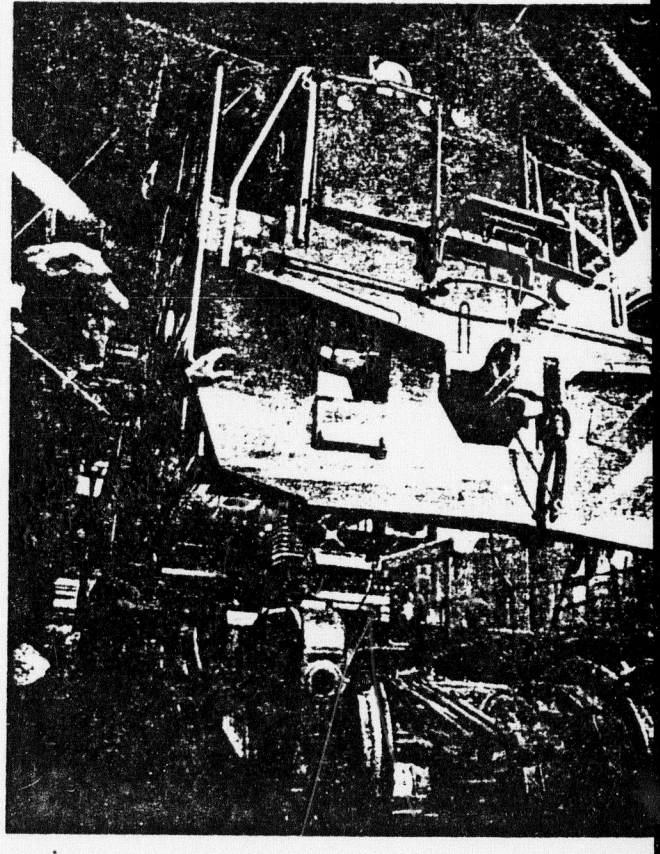
Airco Speer
Carbon-Graphite
Division
Continued

Carbon products set record sales

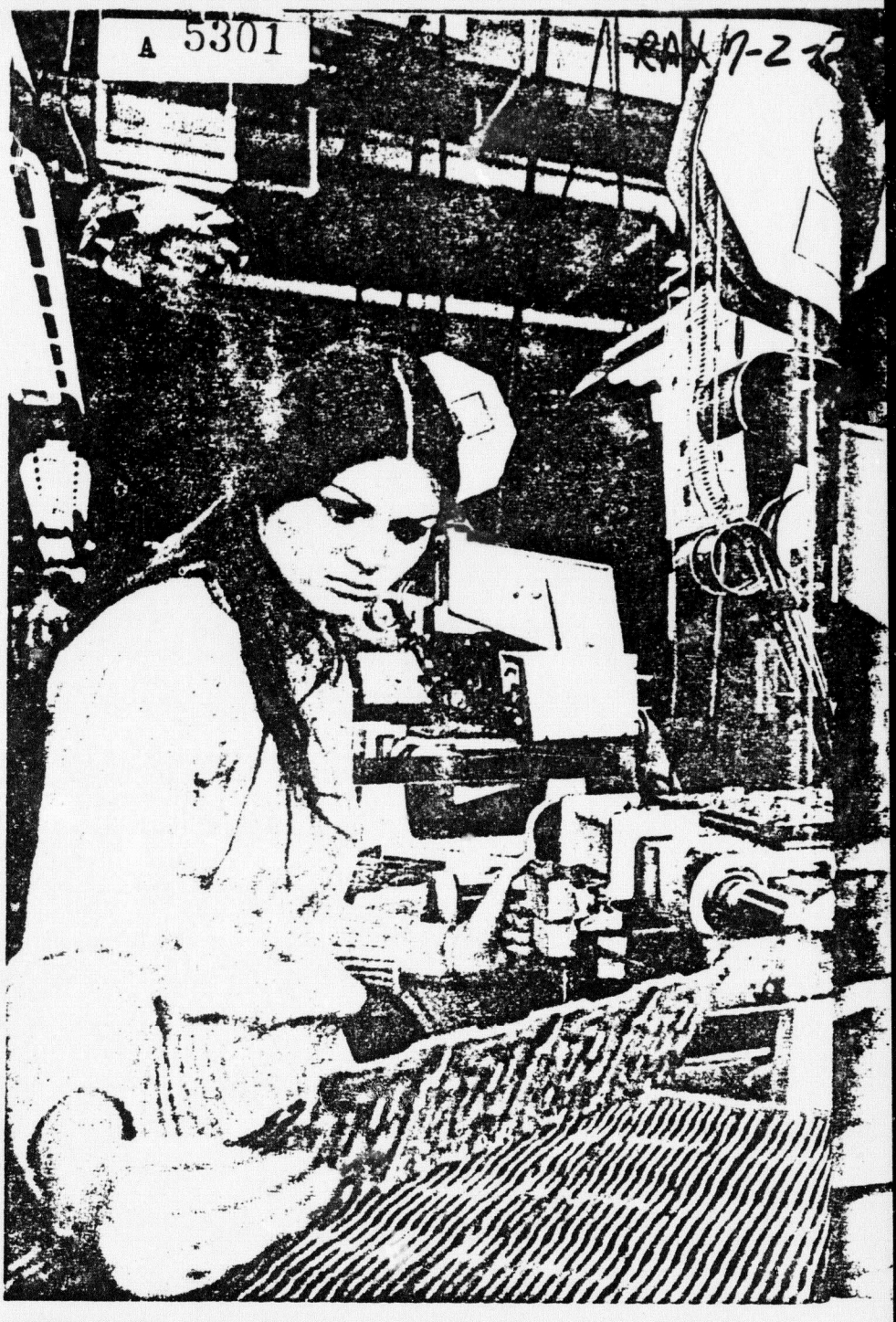
Continued intensive marketing efforts in selected industries for carbon products resulted in record gains in sales for the second year in a row. Particular strength was shown in machined graphite specialties for the electronics, glass and metals industries, electrode material for electrical discharge machining (EDM), and gouging rods for steel foundries and fabricators. Advances also were registered by carbon brushes for motors and generators and carbon electrodes for dry cell batteries. Market development was aided by the introduction of several new and improved products during 1973—including a new premium-grade EDM electrode material, an expanded size-range of block and plate stock, and a longer gouging rod.

Niagara Falls plant expanded

During the year, the division completed the expansion of baking and graphitizing operations at the Niagara Falls plant. A multimillion dollar modernization program is scheduled to get under way at the St. Marys complex in mid-1974 to upgrade various graphite and carbon products production facilities.



Top Far Left: *Technician places industrial diamonds into graphite mold for a geological drilling bit at Hoffman Diamond Tool, Inc., in Punxsutawney, Pennsylvania.*
Top Left: *A graphite electrode is used to machine a die for a plastic product at West Hartford Tool & Die, Inc., Newington, Connecticut.*
Left: *Semiconductor parts secured in graphite fixture enter a glass-to-metal sealing furnace at Houston Electronics Co. of Kane, Pennsylvania.*
Right: *Carbon brushes help power traction motors in General Electric Company's XR diesel-electric locomotives produced at Erie, Pennsylvania.*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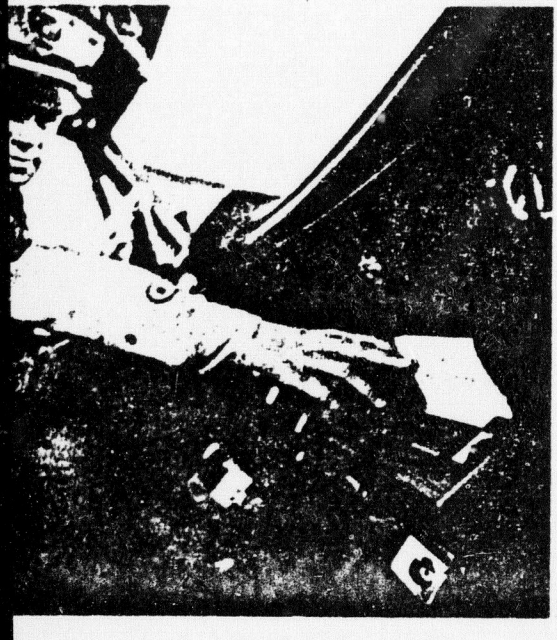
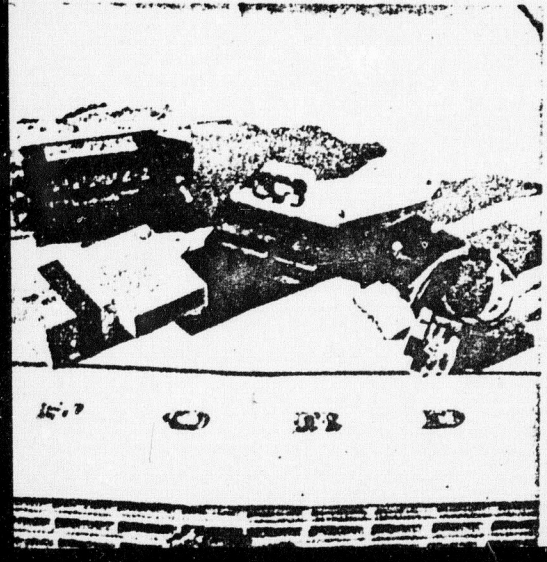
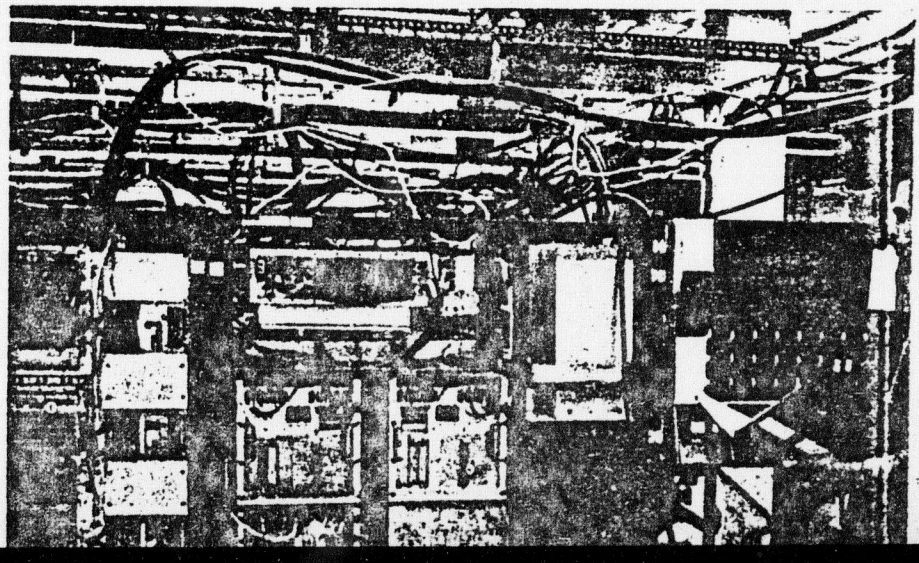
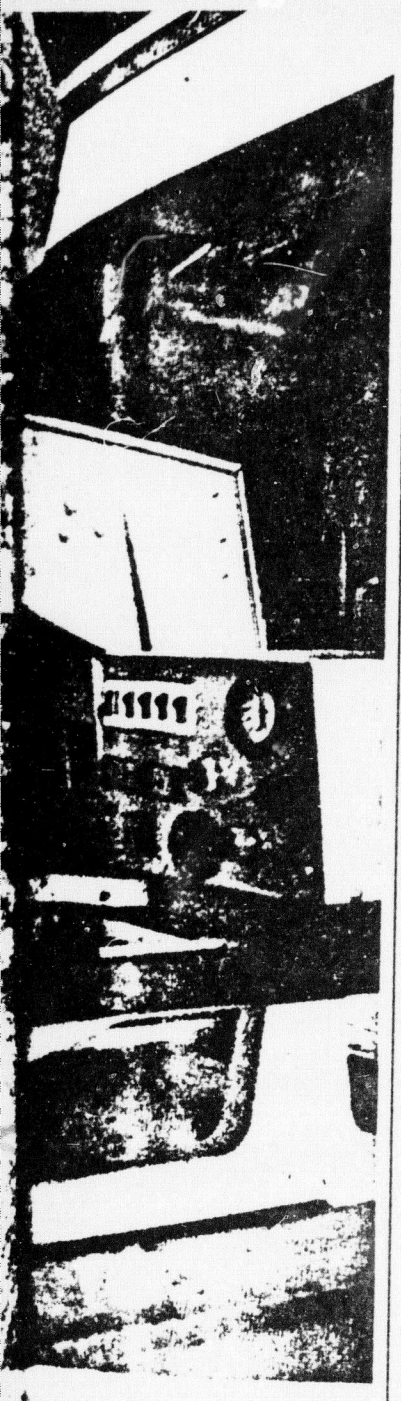








Airco Electronics Division

A 5302

New record highs attained as soaring worldwide demand for resistors and coils boosted sales 48% over 1972 level

Domestic and overseas sales of the Airco Electronics Division climbed to an all-time high in 1973, topping the previous year by 48 per cent. The marked advance in sales resulted from broadened penetration into fast-growing consumer, computer and communications markets. Color televisions, hand calculators and automotive safety and pollution control devices accounted for the major portion of the jump in demand for resistors and coils.

Upward swing in sales continues

Peak production was maintained throughout 1973. Sales continued at a strong pace into the early part of 1974, particularly in the industrial and communications markets.

Expansion aided sales to specialized markets

A new thin-film power resistor facility was placed in production at the Bradford, Pennsylvania plant during late 1973. This new line of power resistors is aimed at meeting the growing needs in the telecommunications and industrial electronics fields.

Products
Fixed composition resistors and capacitors, radio frequency choke coils, thick- and thin-film and carbon-film resistors.

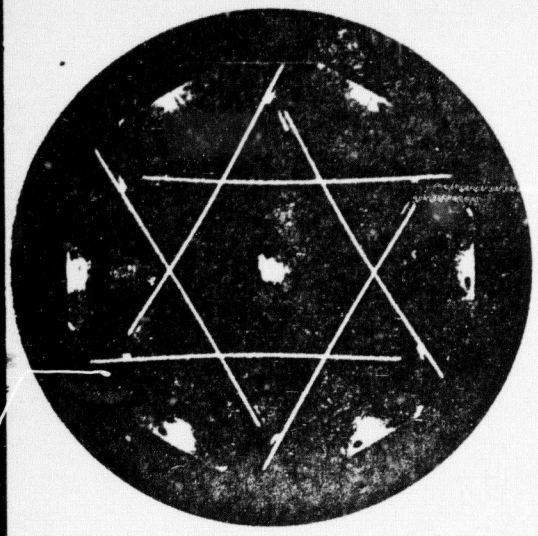
Plants
Bradford, Pa.; Niagara Falls, N.Y.; Nogales, Mexico (Airco de Mexico S.A. de C.V.); Singapore (Airco Singapore Pte., Ltd.)

Markets
Automotive, TV and radio, electronic data processing equipment, industrial instruments, military electronic apparatus.

Top Right: *An assortment of Airco resistors and coils.*
Top Far Left: *Airco resistors and coils are part of the circuitry for Motorola Inc.'s mobile radio units manufactured at Schaumburg, Illinois.*
Top Left: *Resistors are an integral part of Bowmar hand calculators produced at Leominster, Massachusetts.*
Bottom Far Left: *Resistors are important in a growing number of automotive parts, including radios, windshield wiper governors, speed control devices and seat belt interlocks, produced by Philco-Ford, a subsidiary of Ford Motor Company at Lansdale, Pennsylvania, and* **(left)** *are used in Sperry Rand UNIVAC™ computer systems produced at Utica, New York.*

A 5303

Airco Temescal Division



Products
Integrated high-vacuum electron-beam (EB) systems and components, high-vacuum valves, turbomolecular and titanium sublimation pumps, power supplies, EB guns and related monitoring equipment, transformers, processing of special materials in EB furnaces, thin-film production systems, coating systems for decorative and functional plating, bell-jar and fast-cycle coaters and sputtering modules

Plant
Berkeley, Calif.; warehouse in Amsterdam, the Netherlands (Airco Temescal B.V.)

Markets
Steel, alloys, electronics, optical, aircraft, glass, Federal Government.

Sales advance of 31% paced by increased acceptance for coating processes

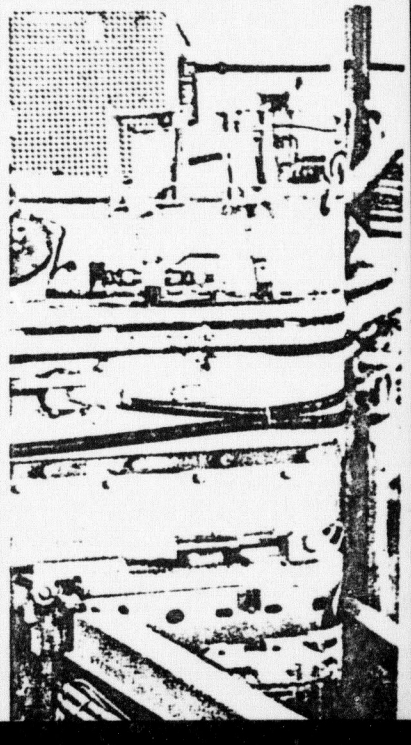
The Airco Temescal Division had an excellent year. Strong customer demand for its metal coating processes and equipment by the jet engine and electronics industries resulted in greatly improved sales.

Gains also posted for hardware

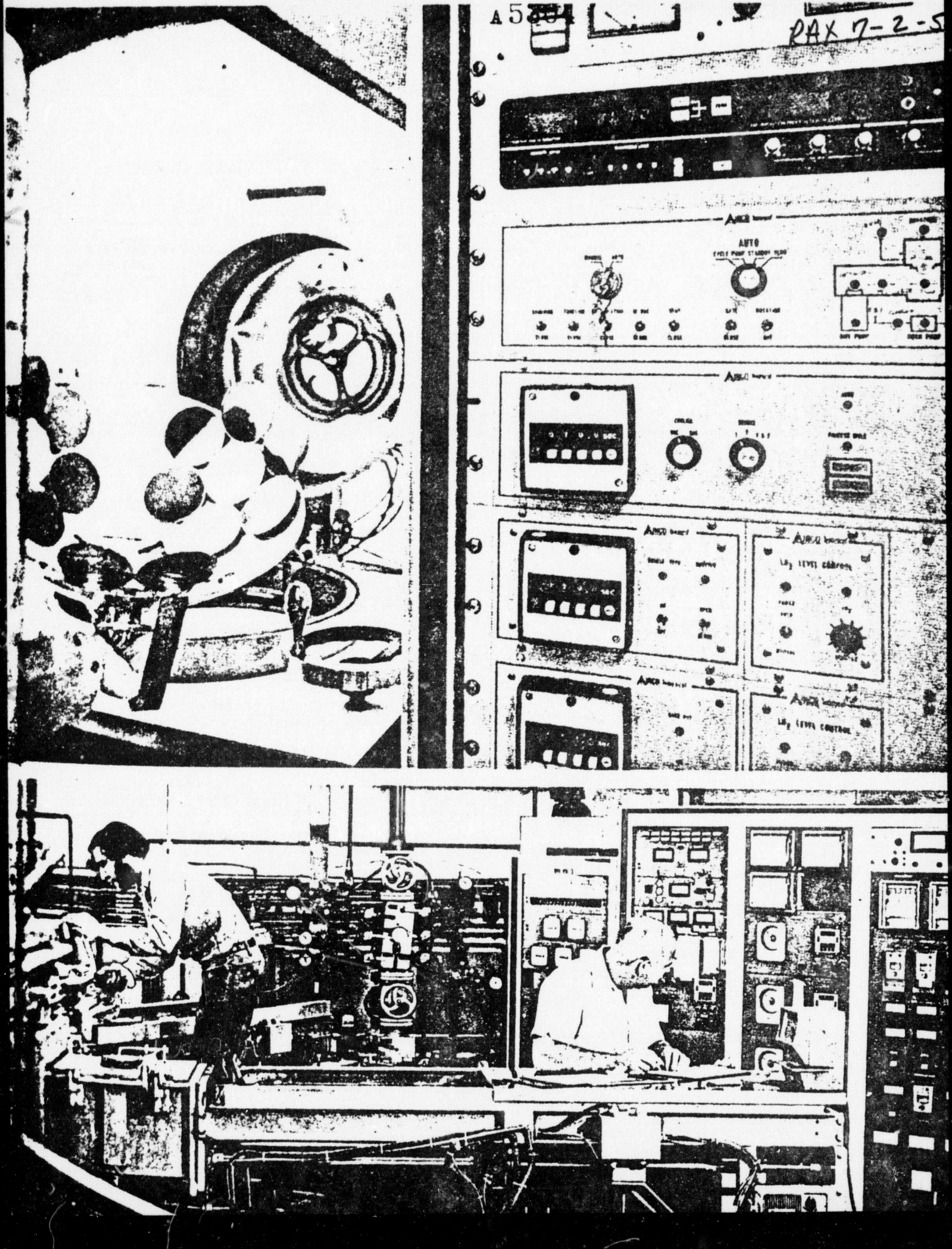
The division's general line of equipment also contributed significantly to 1973's success. An outstanding performer was the FC-1800 fast-cycle coater, which is designed for the high-speed deposition of vaporized metals on microcircuitry components for electronic equipment, particularly computers. In addition, there was an exceptionally strong demand for Temescal's electron-beam guns, power supplies, valves and turbomolecular pumps.

Overseas sales increased

The division's European sales subsidiary, Airco Temescal B.V., located in Amsterdam, performed well in its first full year of operation. Temescal's exclusive Japanese agent, Hakuto Engineering Co., reported greatly improved sales.



Top Left: *Photo taken through a porthole shows aluminum being vaporized (center) by an electron-beam gun in a high-vacuum chamber.*
Left: *Temescal's turbomolecular pump (background) supports chemical laser work at McDonnell Douglas Research Laboratories, St. Louis, Missouri.*
Top Right: *Silicon "memory" wafers for computers emerge from a Temescal FC-1800 fast-cycle coater after receiving a thin layer of aluminum at Intel Corporation's plant in Santa Clara, California.*
Right: *Overall view of one of two coating installations at Temescal's Berkeley plant. Jet engine components are coated here for Pratt & Whitney Aircraft and General Electric.*



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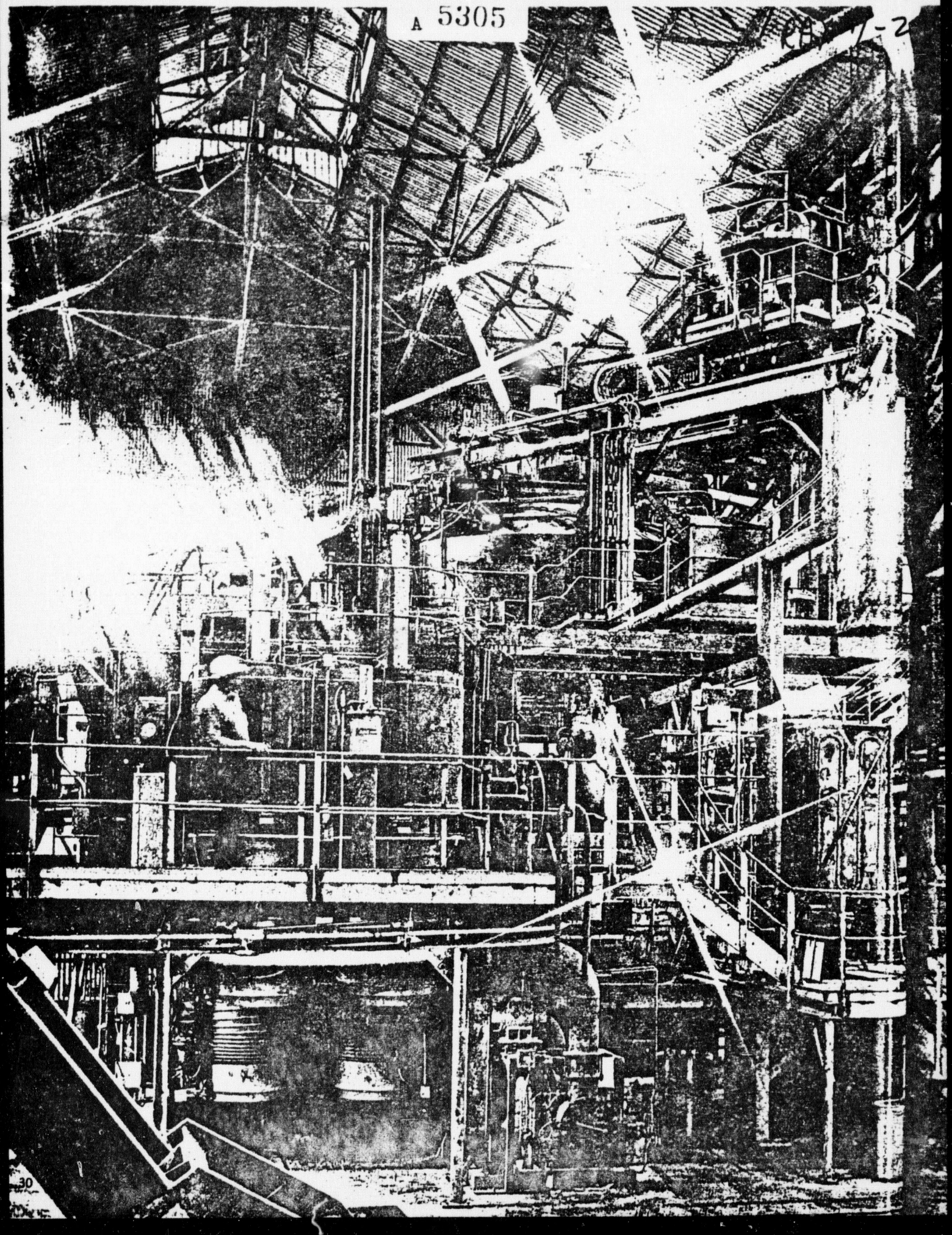

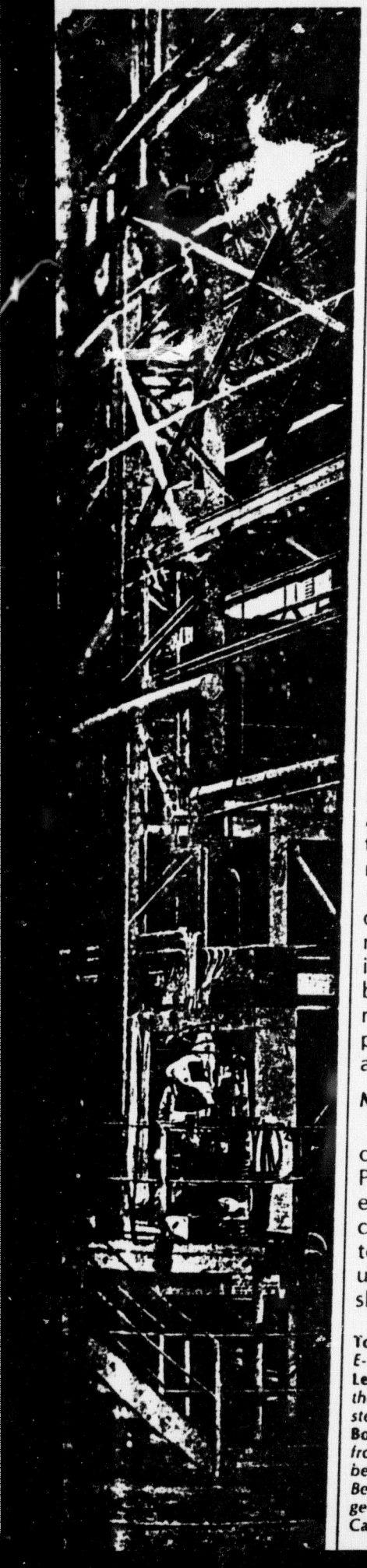

A 5306

Airco Vacuum Metals Division

Severe conversion problems penalized sales of E-Brite 26-1 stainless steel

Despite uptrending sales as 1973 ended, and strong user interest, the overall performance of the Airco Vacuum Metals Division remained disappointing, and this business continued to operate at a loss.

Both sales and earnings were adversely affected by peak production levels maintained by the steel industry throughout 1973. As a result of flat-out production runs, those specialty steel mills Airco engaged to convert E-Brite 26-1 to standard forms were unable to keep pace with Airco's requirements.

Sales are expected to improve in 1974, but not to a level that will eliminate operating losses. Total investment in facilities and inventories for this project was three per cent of Airco's total assets at the end of 1973.

Technical problems solved; user interest high

During 1973, the division solved the quality and welding technical problems that were impeding the overall sales program the previous year. Welding seminars, conducted at several geographic centers of metalworking activity in the U.S., were an important factor in communicating proper welding techniques to key industry representatives.

The superior corrosion resistance and other advantageous properties of the unique metal have continued to maintain customer interest at a very high level. E-Brite 26-1 is being specified more and more by both domestic and foreign petrochemical and food processors, particularly for heat exchangers and tubing used in corrosive environments.

Marketing agreement set with French firm

In early 1973, the division negotiated a conversion and sales agreement with the Paris firm, Creusot-Loire, one of Europe's largest industrial conglomerates. The French company converts Airco's E-Brite 26-1 ingots to various forms, and sells the finished products to European customers. Sales have shown a steady increase during the past year.

Top Right: *End view of various sizes of E-Brite 26-1 tubing.*
Left: *An ingot of E-Brite 26-1 emerges from the casting station of Airco's specialty steelmaking plant in Berkeley.*
Bottom Right: *Tube bundle, fabricated from E-Brite 26-1 by Yuba Industries, will be part of flue gas reheater designed by Bechtel (Power Division) for Mojave generating station operated by South Carolina Edison Company.*

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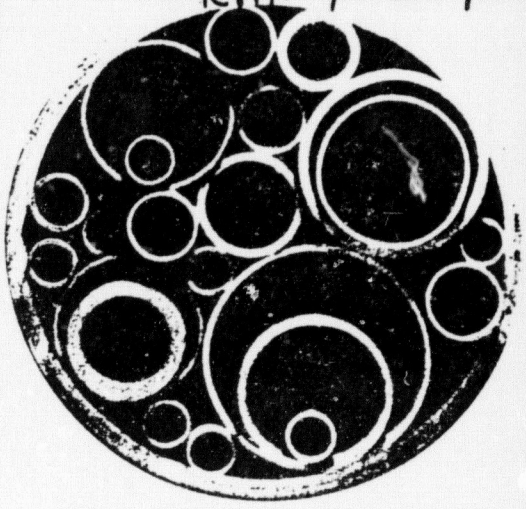
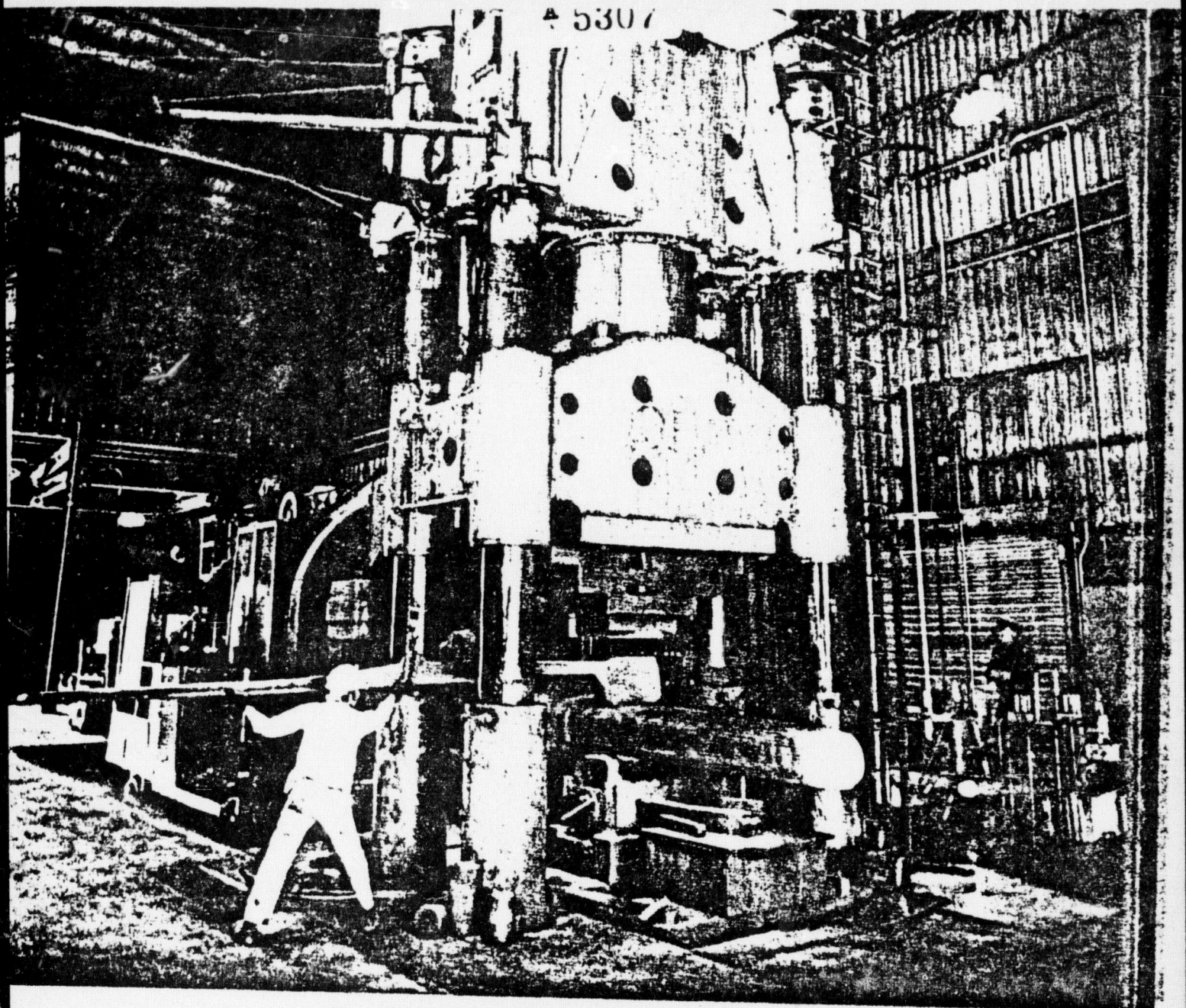


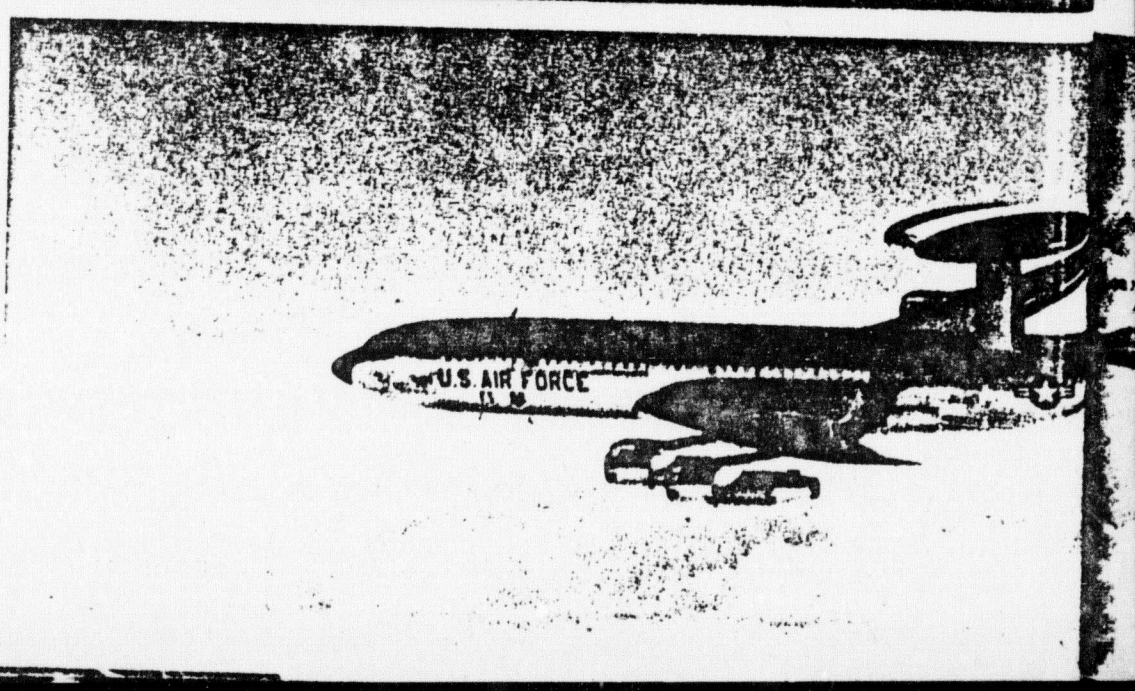
Products
Electron-beam hearth refined stainless and special products in the form of cast slabs and blooms, sheet, strip, bar, billet, wire and stock suitable for converting into tubing and pipe.

Plant
Berkeley, Calif.

Markets
Chemical process, petroleum refining, pulp and paper, power, desalination and water treatment, shipbuilding and marine, food processing.

A 5307





A 5308 Airco Viking Division

Sales increased 22% to record high as demand grew for existing and new products

Sales of the Airco Viking Division in 1973 reached an all-time high for the fifth successive year, as demand continued to soar for the division's line of ring-mill and forged metal products.

Product base broadened

During 1973, the division installed new production equipment to diversify its product line to include extruded and forged, specialty alloy shapes and sections for the machinery, petrochemical and nuclear industries. The new equipment presented several start-up problems which were mostly solved by year-end. The aerospace industry continued to be Viking's major customer for ring-mill products, principally jet engine components.

New titanium alloy introduced

Utili-Ti, a new general purpose titanium alloy, was introduced last year by Viking and Airco Temescal. This joint accomplishment involves the recycling of titanium scrap (turnings resulting from Viking's machining operations) by refining them in an electron-beam furnace operated by Temescal. The resultant ingots are then converted to slabs, billets and bars at Viking's Nevada facility. Viking is also responsible for Utili-Ti's marketing program. Potential applications for the corrosion resistant, relatively low-cost titanium alloy include chemical process hardware, marine fittings and high-performance automotive equipment.

Products
Seamless roll-forged rings, press and hammer forgings, extrusions and extruded-type forgings, crane mill parts, custom rolled and swaged bar—produced in titanium, nickel-base and refractory alloys, stainless steels, aluminum alloy steels, copper alloys.

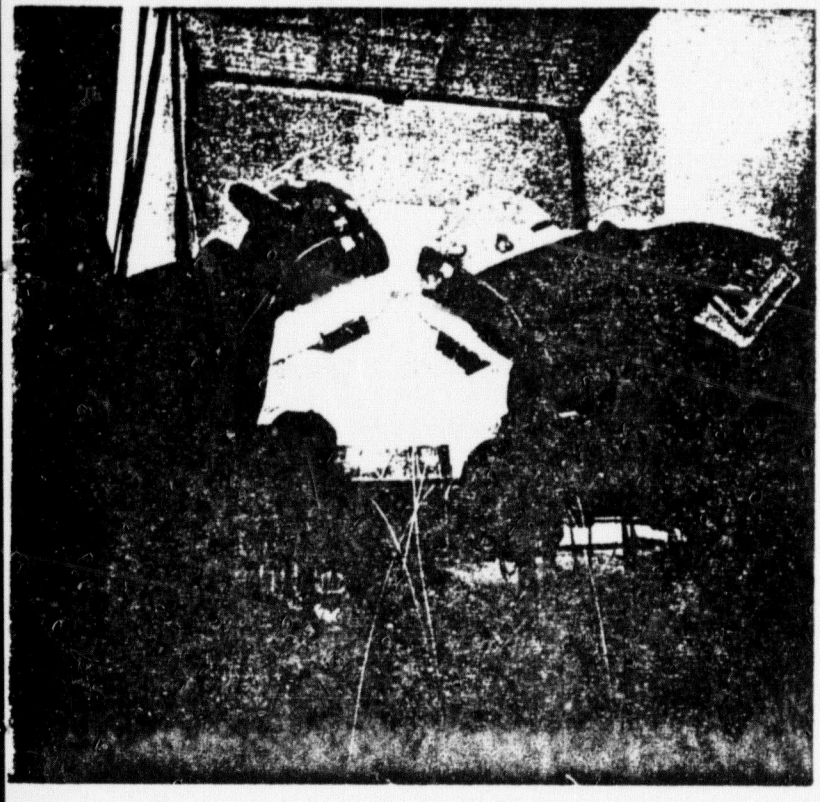
Plants
Albany, Calif.; Verdi, Nev.

Markets
Gas turbine, aerospace, machinery, electronics, petrochemical, nuclear.

Top Right: *Extreme close-up photo of a titanium ingot prior to processing into a ring.*
Top Left: *Workman positions blade for hot chopping a titanium billet after it has been converted from ingot on Viking's new 1,750-ton cogging press.*
Left: *Built by The Boeing Company, this Airborne Warning and Control System (AWACS) is a flying radar station. The stainless steel rings, which make up the bearing assembly in the radar dome, are seamless roll-forged by Airco Viking.*

A 5309

KAX 1-2-10



Airco Technical Institute

Airco's highly successful welding training program becomes a commercial operation

Airco's Welding Training Centers—originally developed for training the unemployed and underemployed—have expanded their programs to include anyone who wishes to make welding a career. The Brooklyn and Baltimore schools operated on a commercial basis last year and are now identified as the Airco Technical Institute (A.T.I.). Plans are currently under way to offer courses to private students in the Cleveland school this year.

Job placement record outstanding

Since opening the first center in Cleveland in 1968, Airco has trained approximately 1,800 welders, shipfitters and burners. Over 95 per cent of these graduates were placed by Airco in well-paying jobs with scores of metalworking companies. The average 13-week program (course length depending upon the person's experience and aptitude) will continue to include free placement assistance from Airco's experienced staff.

Complete course, flexible schedule offered

Backed by Airco's 58 years of experience in the welding business, the A.T.I. welding course is designed for the beginner as well as someone who wishes to upgrade his current skills. The program emphasizes practical instruction, but also includes classroom work in a full range of electric welding, gas welding, cutting and brazing processes, along with blueprint reading and related vocational services. The Baltimore and Brooklyn locations include courses in shipfitting.

Full-time or part-time, day or evening sessions are available to men and women, whether or not he or she is a high school graduate. A.T.I. is accredited by the National Association of Trade and Technical Schools.

Top: *Head Welding Instructor Otis L. Harbin (left) explains operation of cutting torch to a student at A.T.I.'s school in Baltimore. Books, tools and safety clothing used during welding course are displayed on the table in the foreground.*
Bottom: *Two helmeted students practice the skill of arc welding at A.T.I.'s school in Brooklyn.*

A 5310 RAX 7-2-11

Employee Relations and Training

Employment increased almost 6% in 1973; minority, female recruitment emphasized

As of December 31, 1973, there were 13,854 office and plant personnel employed by Airco in its domestic and foreign operations—up nearly six per cent over the previous year. Increases in employment at Airco Electronics' foreign operations accounted for the bulk of the rise.

Of the 59 collective bargaining agreements (covering 1,229 employees) negotiated throughout the year, 57 were settled without a work stoppage. Two agreements were settled satisfactorily after strikes. Airco's total lost-time rate due to strikes was less than one-half the national rate in 1973.

Twenty plants receive MCA safety awards

During the year, 20 manufacturing locations became eligible to receive safety awards from the Manufacturing Chemists Association for completing a full year without a disabling injury. One location, Airco Welding Products' acetylene plant in Atlanta, Georgia, became eligible for the 10th year in a row.

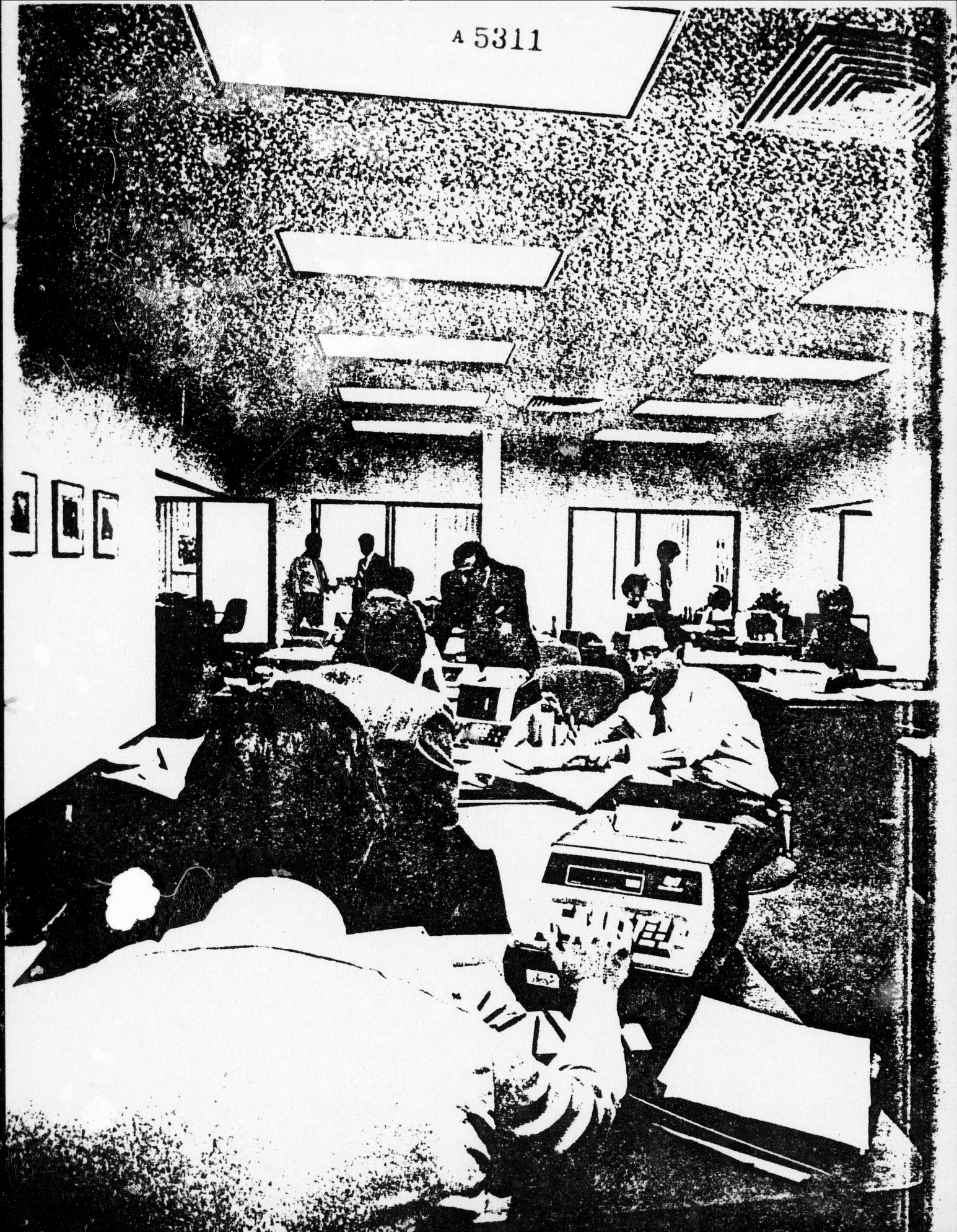
Equal employment and management training programs proved successful

More intensive and comprehensive affirmative action plans were implemented throughout the company in 1973—with greater stress on equal employment opportunity for women. The company's program for recent college graduates emphasizes attracting minority group members and females for professional-level positions.

Airco's 1973 management training course graduated 27 members of middle management. Particular emphasis last year was given to finance, human resource management and approaches to problem analysis and solution.

Edith H. Onyan, Business Economist in Airco's Corporate Planning and Development Department, presents results of a group session during the 1973 management training course, which she attended at Sterling Forest Conference Center, Tuxedo, New York.

A 5311



...quarters staff of Airco's
...al Accounting Depart-
...developing data for the
...'s Annual Report.

A 5312

Financial Section

RAX 7-2-13

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Sales and Earnings by Lines of Business*

(Dollars in Millions)

	Net Sales				Earnings(1)			
	1973		1972		1973		1972	
	$	%	$	%	$	%	$	%
Industrial Gases; Cryogenic, Welding and Cutting Equipment	[illegible]	[illegible]	240.0	48.7	[illegible]	[illegible]	26.8	60.8
Ferroalloys	[illegible]	[illegible]	128.3	26.1	[illegible]	[illegible]	3.9	8.8
Carbon-Graphite, Electronics, High-Vacuum Electron-Beam Equipment and Metals	[illegible]	[illegible]	81.3	16.5	[illegible]	[illegible]	7.2	16.3
Medical Gases and Equipment	[illegible]	[illegible]	42.7	8.7	[illegible]	[illegible]	6.2	14.1
Total	[illegible]	[illegible]	492.3	100.0	[illegible]	[illegible]	44.1	100.0

(1) Before income taxes, interest and corporate expense.

**Continuing operations.*

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A 5313

Sales and Net Income Per Share by Quarter*

RAX 7-2-14

	Net Sales (Dollars in Millions)		Net Income Per Share	
	1973	1972	1973	1972
1st Quarter	[illegible]	$119.5	[illegible]	$ .50
2nd Quarter	[illegible]	127.0	[illegible]	.50
3rd Quarter	[illegible]	110.7	[illegible]	.29
4th Quarter	[illegible]	135.1	[illegible]	.24
Total for the Year	[illegible]	$492.3	[illegible]	$1.53

Where the Sales Dollar Went in 1973

Materials and Services	[illegible]
Payrolls	[illegible]
Depreciation	[illegible]
Taxes	[illegible]
Dividends Paid	[illegible]
Retained Earnings	[illegible]

1973 Sales to Industries

[illegible]% Steel Mills and Foundries

[illegible]% Aircraft, Space and Defense

[illegible]% Machinery

[illegible]% Foods and Beverages

[illegible]% Medical, Dental and Personal Care

[illegible]% Metal Fabricators

[illegible]% Electrical Equipment and Electronics

[illegible]% Transportation (except Highway)

[illegible]% Trades and Services

[illegible]% Motor Vehicles

[illegible]% Industrial Chemicals

[illegible]% Government and Education

[illegible]% Nonferrous Metals, Glass and Other Industries

*Continuing operations.

A 5314

Statement of Accounting Policies

The accounting policies followed by Airco in maintaining financial records and preparing financial statements are set forth below:

Consolidation The financial statements include the accounts of all domestic and foreign subsidiaries of Airco and the equity in the underlying net assets of significant affiliated companies when Airco's ownership is in excess of 20%.

Inventories Inventories are valued at the lower of average cost or market.

Depreciation and Amortization Allowances for depreciation and amortization are accumulated generally on a straight-line basis. Alloys production equipment acquired after January 1, 1971 and electron-beam production facilities are depreciated on the units of production method.

Goodwill, Patents and Trademarks Goodwill is amortized on the straight-line basis over a period of 40 years. Patents and trademarks are valued at $1 for financial statement purposes; related costs are charged to operations in the year incurred.

Income Taxes Income taxes are provided in the year transactions enter into the determination of net income regardless of when such transactions are recognized for tax purposes. Accordingly, income taxes affecting payments in future years are included in deferred income taxes. Investment tax credits are included as reductions of income tax expense in the year the credits arise.

Research and Development Expenditures for research and development are charged to operations in the year incurred.

Foreign Currency Translation Current assets and current liabilities are translated into U.S. dollars at the exchange rates in effect at the reporting dates. Long-term assets and liabilities and stockholders' equity are translated at the rates of exchange in effect when acquired, incurred or issued. Revenues, costs and expenses for each month are translated at the exchange rate in effect at the end of the month, except for depreciation and amortization which are translated at the rates of exchange in effect when the respective assets were acquired. Net unrealized gains from foreign currency translation are deferred. Net unrealized losses from foreign currency translation would be charged to income to the extent that they exceed gains previously deferred. All other exchange adjustments are charged or credited to income.

A 5315

Financial Review

RAX 7-2-16

Acquisitions and Disposition During 1973, in transactions accounted for as purchases, Airco acquired eight welding products supply companies and two companies operating in the industrial gases business for 15,332 treasury shares of Airco, Inc. common stock having a fair market value of approximately $185,000 and approximately $1,038,000 in cash. During 1972, in transactions accounted for as purchases, Airco acquired four welding products supply companies for 35,292 treasury shares of Airco, Inc. common stock having a fair market value of approximately $606,000 and approximately $453,000 in cash.

The operations of the above mentioned companies, which are not material, have been included in the consolidated financial statements from the dates of acquisition.

On January 24, 1973, Airco announced the discontinuance of the carbide-acetylene business. The net result of this transaction was accounted for at the end of 1972 as set forth on page 43 under Discontinued Operations and Extraordinary Item.

Foreign Operations At December 31 and for each year then ended, the net assets, sales and income of consolidated foreign subsidiaries were:

	1973	1972
Net assets	$ 30,371,000	$ 25,821,000
Net sales	$ 50,142,000	$ 35,587,000
Net income	$ 2,551,000	$ 2,892,000

Net unrealized gains from foreign currency translation amounted to $924,000 in 1973, while net unrealized losses from foreign currency translation amounted to $232,000 in 1972. The 1973 amount was deferred and included in other liabilities —miscellaneous while the 1972 amount was applied against the gains previously deferred. The balance of net unrealized gains from foreign currency translation amounted to $1,269,000 at December 31, 1973 and $345,000 at December 31, 1972. Realized exchange gains included in income amounted to $129,000 in 1973 and $55,000 in 1972. Long-term debt repayable in foreign currency would increase by $272,000 if translated at rates prevailing at December 31, 1973.

Inventories The inventories at December 31 included:

	1973	1972
Finished goods	$ 48,277,000	$ 73,450,000
Goods in process	28,516,000	31,086,000
Raw materials and supplies	50,638,000	50,577,000
Total inventories	$127,431,000	$155,113,000

Property, Plant and Equipment Capital expenditures during 1973 aggregated $28,800,000, down from $40,500,000 spent in 1972. Depreciation and amortization amounted to $27,530,000 in 1973 and $24,730,000 in 1972.

Short-Term Borrowings Airco had available at various domestic banks, lines of credit aggregating $47,000,000 at December 31, 1973. The average daily loan outstanding during 1973 was approximately $18,800,000 at an average rate of approximately 8%. The maximum debt outstanding at any one time during the year was $27,500,000. Compensating balance requirements for the domestic lines are the same as those for the agreement explained under the caption "Long-Term Debt", except there are no balance requirements against Eurodollar loans, which are obtained from foreign branches of domestic banks. Average compensating balances maintained during 1973 against short-term domestic borrowings amounted to $3,400,000. No fees are incurred on unused portions of credit lines, and accordingly such lines can be withdrawn at the option of the various banks. There was no domestic bank debt outstanding against the lines at December 31, 1973.

Long-Term Debt Following are the amounts payable annually during the five-year period ending December 31, 1978. Included in the 1977 and 1978 amounts payable are sinking fund deposits on the 3⅞% convertible subordinated debentures:

1974	$ 5,836,000
1975	5,977,000
1976	27,717,000
1977	18,941,000
1978	18,944,000

Subject to certain limitations and payments of premiums, prepayments on all long-term debt may be made. Of the total long-term debt of $167,130,000 at December 31, 1973, $4,356,000 was repayable in foreign currency.

Under a 1972 agreement, domestic banks are committed to lend $50,000,000 to Airco through July 31, 1975, of which $45,000,000 had been borrowed and was outstanding at December 31, 1973. Repayment of these notes is required to be made in equal semi-annual installments over a four-year period beginning on January 31, 1976. The notes bore interest at the best rate established, from time to time, by The Chase Manhattan Bank (National Association), one of the participating banks, until July 31, 1973 at which time the interest rate was increased to ¼% above that rate until July 31, 1975, and ½% above that rate, thereafter.

In connection with this agreement, Airco, under oral, informal arrangements, which do not restrict the withdrawal or use of funds, is expected to maintain and has substantially maintained during 1973 a compensating balance of 20% of the average bank loans outstanding. Such depository amounts are determined from the banks' ledger records adjusted for estimated uncollected funds. Average compensating balances maintained during 1973 under these arrangements amounted to $10,000,000. Such arrangements are not required under any other long-term debt financing.

The average balance on Airco's books during 1973 related to compensating balance arrangements for both short-term borrowings and long-term debt was approximately $9,000,000. This balance differs from the banks' records due to delays in the presentment of checks and deposits in transit.

The instruments relating to long-term debt contain provisions which limit the amount that may be expended for the payments of cash dividends and the purchase, redemption, or retirement of Airco's capital stock. As of December 31, 1973, under the most restrictive of these provisions, the amount of retained earnings unrestricted for such purposes was approximately $32,800,000.

A 5317

RAX 7-2-18

Capital Stock Capital stock at December 31 consisted of the following shares:

	Shares		
	Authorized	*Outstanding*	
		1973	1972
Preferred stock, $5 par value	1,000,000	—	—
Common stock, $1 par value, net of shares held in treasury of 444,009 (1973) and 3,506 (1972)	20,000,000	11,324,730	11,765,233

Common stock reserved at December 31 consisted of:

	Shares	
	1973	1972
Conversion of debentures at $31.25 a share through 1987	1,016,384	1,016,384
Stock option plan	149,762	149,762
Stock purchase plan:		
Unissued	—	383,000
Held in treasury	229,199	1,064

In 1973 and 1972 Airco purchased 383,000 shares and 17,000 shares of its common stock, respectively, for issuance to employees under the employee stock purchase plan and 227,700 shares and 35,292 shares, respectively, for use in acquisitions or other general corporate purposes.

Stock Options and Stock Purchase Plans Under Airco's stock option plans, shares of common stock have been made available to certain key employees at the fair market value at the date the options were granted.

A summary of option data for 1973 and 1972 is shown below:

	1973		1972	
	Number of Shares Under Option	*Aggregate Option Price*	*Number of Shares Under Option*	*Aggregate Option Price*
Outstanding, January 1	120,000	$2,808,000	133,148	$3,237,000
Granted	60,000	832,000	8,000	160,000
Exercised	—	—	(198)	(3,000)
Terminated	(42,800)	(1,242,000)	(20,950)	(586,000)
Outstanding, December 31	137,200	$2,398,000	120,000	$2,808,000
At December 31:				
Exercisable	39,800	$ 781,850	61,600	$1,629,000
Available for grant	12,562		29,762	

The employee stock purchase plan entitles eligible employees to purchase unissued common stock or shares held in treasury at 85% of the closing market price of the common stock at certain quarterly dates. Through December 31, 1973, an aggregate of 570,301 shares (for consideration of $8,483,000) have been purchased.

Federal and Foreign Taxes on Income Federal and foreign taxes on income consisted of:

	1973	1972
Current income taxes (principally Federal)	$ 5,830,000	$3,397,000
Deferred income taxes	6,489,000	7,618,000
Investment tax credits	(2,070,000)	(1,759,000)
Total	$10,249,000	$9,256,000

A 5318 RAX 7-2-19

Deferred income taxes arise due to timing differences between reported and taxable income relating to accelerated methods of depreciation, inventory valuation in a foreign subsidiary, allowances for estimated losses on facility abandonments, certain deferred charges and taxes on the unremitted earnings of certain foreign subsidiaries and affiliates. The tax effects of these differences which have been reflected in deferred income taxes and except as noted below, related principally to Federal taxes, were as follows:

	1973	1972
Excess of tax over book depreciation	$3,583,000	$6,663,000
Realization of losses provided in prior years	3,928,000	641,000
Inventory valuation in a foreign subsidiary	(2,329,000)	(953,000)
Other	1,307,000	1,267,000
Total	$6,489,000	$7,618,000

Total Federal and foreign taxes on income were less than would have resulted from application of the normal United States Federal tax rate for the following reasons:

	1973	1972
Normal United States Federal tax rate	48.0%	48.0%
Increase (Reduction) in taxes resulting from:		
Investment tax credit	(7.1)	(6.4)
Taxes not provided on unremitted earnings of foreign subsidiaries	(5.0)	(3.8)
Other	(1.0)	(3.9)
Actual effective tax rate	34.9%	33.9%

Taxes have not been provided on unremitted earnings of certain foreign subsidiaries whose earnings are to be reinvested in plant expansion, working capital and payment of foreign long-term debt. The total of such foreign earnings included in consolidated retained earnings is not material.

Discontinued Operations and Extraordinary Item The discontinuance of the carbide-acetylene business resulted in an extraordinary charge of $16,000,000 in 1972 (net of related tax benefits of $14,740,000) based on estimated costs in connection with the fulfillment of commitments, the termination of operations and the disposition of the carbide-acetylene plant assets. The related estimated liabilities are included in current accruals and miscellaneous other liabilities. The net sales and related expenses, including income tax effects, applicable to the discontinued operations have been excluded from the respective captions in the statement of consolidated income for 1972 and have been shown net under the caption "Income From Discontinued Operations". Net sales relating to discontinued operations were $25,694,000 in 1972.

Earnings Per Share of Common Stock Earnings per share of common stock is based on the weighted average number of shares of common stock outstanding during the respective years. Dilution from common stock equivalents (certain shares issuable under stock option and purchase plans) is not significant.

Fully diluted earnings per share recognizes the potential exercise of common stock equivalents, and the assumed conversion of the 3⅞% subordinated debentures. For the purpose of this calculation, net income is adjusted to reflect elimination of interest and issue expense, net of income taxes, relating to the assumed conversion of the debentures.

A 5319

RAX 7-2-20

Airco and its subsidiaries maintain retirement plans covering substantially all officers and employees. It is Airco's policy generally to fund the pension cost accrued. The total pension expense for the years ended December 31, 1973 and 1972 was approximately $3,983,000 and $3,742,000, respectively, the increase resulting principally from improved benefits. As to some of the retirement plans, fund assets were approximately $11,700,000 in excess of the actuarially computed value of vested benefits as of the most recent valuation dates and, as to the other plans, fund assets were approximately $4,100,000 less than the actuarially computed value of vested benefits at such dates.

The unexpended portion of amounts authorized for capital expenditures at December 31, 1973 approximated $28,380,000 as to which commitments have been made for approximately $11,397,000.

Rental expense in 1973 and 1972 was $17,353,000 and $16,664,000, respectively, of which $11,975,000 and $11,181,000, respectively, related to noncapitalized financing leases.

Minimum rental commitments under noncancelable leases are as follows:

	Rental Commitments	*Portion Relating to Noncapitalized Financing Leases*
1974	$ 15,300,000	$ 14,200,000
1975	13,400,000	12,700,000
1976	12,000,000	11,400,000
1977	10,600,000	10,100,000
1978	8,800,000	8,500,000
1979-83	34,400,000	32,900,000
1984-88	9,800,000	8,800,000
1989-93	7,700,000	7,700,000
Total	$112,000,000	$106,300,000

Of the $112,000,000 shown above, $5,700,000 pertained to warehouse and office rentals and $106,300,000 to plant and equipment.

The present values of the minimum rental commitments for all noncapitalized financing leases approximated $74,900,000 at December 31, 1973 and $66,900,000 at December 31, 1972. Of these amounts, $60,400,000 and $51,000,000 pertained to production facilities and $14,500,000 and $15,900,000 to distribution and other equipment at December 31, 1973 and December 31, 1972, respectively. Of the amounts pertaining to production facilities, approximately 93% pertain to tonnage gas plants, which supply customers under long-term sales contracts providing for aggregate minimum revenues which more than cover the aggregate rentals under such leases. Interest rates ranging from 4.3% to 14% for 1973 and 4.3% to 12% for 1972 were used to calculate the present values.

If noncapitalized financing leases had been capitalized, the related assets amortized using the straight-line method, and interest expense accrued on the assumed outstanding liability, Airco's net income would have been affected by less than three per cent of the average net income for the most recent three years.

Statement of Consolidated Income

A 5320

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AIRCO, INC. AND SUBSIDIARIES

For the years ended December 31, 1973 and 1972

	1973	1972
Net Sales	$583,811,000	$492,295,000
Other Income—Net	1,022,000	2,362,000
Total	584,833,000	494,657,000
Deductions		
Cost of Goods Sold	467,184,000	394,029,000
Selling, Administrative and Other Expenses	75,450,000	63,752,000
Interest Expense	12,839,000	9,676,000
Federal and Foreign Taxes on Income	10,249,000	9,256,000
Total	565,722,000	476,713,000
Income From Continuing Operations	19,111,000	17,944,000
Income From Discontinued Operations, Net of Income Taxes	—	77,000
Income Before Extraordinary Item	19,111,000	18,021,000
Extraordinary Item, Net of Income Taxes	—	(16,000,000)
Net Income	$ 19,111,000	$ 2,021,000
Earnings Per Share of Common Stock		
Income From Continuing Operations	$1.66	$1.53
Income From Discontinued Operations	—	.01
Income Before Extraordinary Item	1.66	1.54
Extraordinary Item, Net of Income Taxes	—	(1.37)
Net Income	$1.66	$ .17
Fully Diluted Earnings Per Share		
Income From Continuing Operations	$1.56	$1.45
Income From Discontinued Operations	—	.01
Income Before Extraordinary Item	1.56	$1.46
Extraordinary Item, Net of Income Taxes	—	*
Net Income	$1.56	*

*The Extraordinary Item and Net Income amounts, which were anti-dilutive in 1972, have been omitted.

Information under the headings "Statement of Accounting Policies" and "Financial Review" is an integral part of this statement.

Consolidated Balance Sheet

A 5321

RAX 7-2-22

December 31, 1973 and 1972

ASSETS	1973	1972
CURRENT ASSETS		
Cash and Short-Term Securities, at cost		$ 11,642,000
Notes and Accounts Receivable (less allowances for doubtful accounts—1973, $1,570,000; 1972, $922,000)		96,331,000
Inventories		155,113,000
Prepaid Expenses		3,802,000
Total Current Assets		266,888,000
PROPERTY, PLANT AND EQUIPMENT (at cost)		
Land		8,241,000
Buildings and Leasehold Improvements		104,152,000
Machinery and Equipment		367,624,000
Construction in Progress		24,991,000
Contract Rights to Production and Distribution		5,250,000
Total		510,258,000
Less Accumulated Allowances for Depreciation, Amortization and Obsolescence		203,053,000
Property, Plant and Equipment—Net		307,205,000
INVESTMENTS (principally at equity)		3,179,000
LONG-TERM RECEIVABLES (less unamortized discount based on imputed interest rate of 9½%—1973, $1,703,000; 1972, $2,320,000)		15,544,000
DEFERRED CHARGES		8,258,000
GOODWILL, PATENTS AND TRADEMARKS (net of amortization)		6,356,000
TOTAL		$607,430,000

Information under the headings "Statement of Accounting Policies" and "Financial Review" is an integral part of this statement.

LIABILITIES AND STOCKHOLDERS' EQUITY	1973	1972
CURRENT LIABILITIES		
Accounts Payable	[illegible]	$ 48,555,000
Bank Loans and Currently Maturing Long-Term Debt	[illegible]	22,790,000
Accruals	[illegible]	20,883,000
Federal and Foreign Taxes on Income	[illegible]	898,000
Total Current Liabilities	[illegible]	93,126,000
LONG-TERM DEBT		
Industrial Revenue Bonds, 5¾%, due 1984-93	[illegible]	—
Convertible Subordinated Debentures, 3⅞%, due 1977-87	[illegible]	31,762,000
Sinking Fund Debentures, 6½%, due 1987	[illegible]	2,367,000
Domestic Bank Notes, 10% Currently, due 1976-79	[illegible]	50,000,000
Foreign Bank Notes, 6⅜16-12% Currently, due 1975-88	[illegible]	19,819,000
Promissory Notes, 4.85-7¾% Currently, due 1975-88	[illegible]	66,951,000
Other Debt (principally mortgages)	[illegible]	6,426,000
Total Long-Term Debt	[illegible]	177,325,000
OTHER LIABILITIES AND DEFERRED CREDITS		
Deferred Income Taxes	[illegible]	66,675,000
Miscellaneous	[illegible]	7,865,000
Total Other Liabilities and Deferred Credits	[illegible]	74,540,000
STOCKHOLDERS' EQUITY	[illegible]	262,439,000
TOTAL	[illegible]	$607,430,000

Statement of Stockholders' Equity

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For the years ended December 31, 1973 and 1972

	Common Stock—$1 par value	Capital in Excess of Par Value	Retained Earnings	Treasury Stock—at cost	Total Stockholders' Equity
Balance at January 1, 1972	$11,686,000	$110,053,000	$147,107,000	$ (611,000)	$268,235,000
Net Income			2,021,000		2,021,000
Purchased for Treasury (52,293 shares)				(929,000)	(929,000)
Stock Used for Employee Stock Purchase Plan (113,632 shares)	83,000	985,000		831,000	1,899,000
Stock Option Plan (198 shares)		3,000			3,000
Purchase of a Company (35,292 shares)				606,000	606,000
Dividends on Common Stock ($.80 per share)			(9,396,000)		(9,396,000)
Balance at December 31, 1972	11,769,000	111,041,000	139,732,000	(103,000)	262,439,000
Net Income			19,111,000		19,111,000
Purchased for Treasury (610,700 shares)				(8,230,000)	(8,230,000)
Stock Used for Employee Stock Purchase Plan (154,865 shares)		(313,000)		2,112,000	1,799,000
Purchase of a Company (15,332 shares)				185,000	185,000
Dividends on Common Stock ($.80 per share)			(9,227,000)		(9,227,000)
Balance at December 31, 1973	$11,769,000	$110,728,000	$149,616,000	$ (6,036,000)	$266,077,000

Information under the headings "Statement of Accounting Policies" and "Financial Review" is an integral part of this statement.

Statement of Changes in Consolidated Financial Position

AIRCO, INC. AND SUBSIDIARIES

For the years ended December 31, 1973 and 1972

	1973	1972
Sources of Working Capital		
From Operations		
Income Before Extraordinary Item	$ 19,111,000	$ 18,021,000
Charges Not Requiring Current Outlays of Working Capital		
Depreciation and Amortization (1972 includes $3,422,000 from discontinued operations)	27,530,000	28,152,000
Deferred Income Taxes	7,801,000	7,627,000
Working Capital Provided from Operations, Exclusive of Extraordinary Item	54,442,000	53,800,000
Extraordinary Item, Net of Income Taxes	—	(16,000,000)
Charges (Credits) Not Involving Working Capital		
Reduction in Net Long-Term Assets Due to Discontinuance of Business	—	26,363,000
Deferred Income Taxes	—	(14,740,000)
Working Capital Used for Extraordinary Item	—	(4,377,000)
Total from Operations	54,442,000	49,423,000
Proceeds from Long-Term Debt	18,310,000	57,137,000
Sales of Stock to Officers and Employees	1,799,000	1,902,000
All Other Sources–Net	477,000	(126,000)
Total Sources of Working Capital	75,028,000	108,336,000
Uses of Working Capital		
Capital Expenditures for Property, Plant and Equipment	28,800,000	40,500,000
Dividends on Common Stock	9,227,000	9,396,000
Reduction in Long-Term Debt	28,505,000	67,536,000
Purchase of Stock for Treasury	8,230,000	929,000
Total Uses of Working Capital	74,762,000	118,361,000
Increase (Decrease) in Working Capital During Year	266,000	(10,025,000)
Working Capital at Beginning of Year	173,762,000	183,787,000
Working Capital at End of Year	$174,028,000	$173,762,000
Changes in Elements of Working Capital		
(Decrease) Increase in Current Assets		
Cash and Short-Term Securities	$ 4,196,000	$ (8,988,000)
Notes and Accounts Receivable	5,337,000	9,898,000
Inventories	(27,682,000)	31,559,000
Prepaid Expenses	997,000	(131,000)
Change in Current Assets	(17,152,000)	32,338,000
(Decrease) Increase in Current Liabilities		
Accounts Payable	(9,673,000)	17,849,000
Bank Loans and Currently Maturing Long-Term Debt	(11,806,000)	18,678,000
Accruals	4,124,000	5,809,000
Federal and Foreign Taxes on Income	(63,000)	27,000
Change in Current Liabilities	(17,418,000)	42,363,000
Increase (Decrease) in Working Capital During Year	$ 266,000	$ (10,025,000)

Information under the headings "Statement of Accounting Policies" and "Financial Review" is an integral part of this statement.

Accountants Opinion

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HASKINS & SELLS
CERTIFIED PUBLIC ACCOUNTANTS

TWO BROADWAY
NEW YORK 10004

To the Stockholders of Airco, Inc.:

We have examined the consolidated balance sheets of Airco, Inc. and subsidiaries as of December 31, 1972 and 1973 and the related statements of income, stockholders' equity, and changes in financial position for the years then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the above-mentioned statements present fairly the financial position of the companies at December 31, 1972 and 1973 and the results of their operations and changes in their financial position for the years then ended, in conformity with generally accepted accounting principles consistently applied.

Haskins & Sells

March 1, 1974

Five-Year Financial Summary

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Figures In Thousands Except Per Share and Market Data

	1973	1972	1971**	1970	1969**
Sales and Earnings					
Net sales*	$ [illegible]	492,295	411,409	405,634	403,537
Depreciation and amortization*	$ 27,530	24,730	23,260	22,159	21,188
Income before taxes*	$ 29,760	27,200	31,661	29,648	29,557
Income from continuing operations	$ 19,111	17,944	18,248	17,105	18,590
Income (loss) from discontinued operations		77	815	(111)	1,736
Income before extraordinary items	$ 19,111	18,021	19,063	16,994	20,326
Extraordinary items		(16,000)	—	(10,500)	—
Net income	$ 19,111	2,021	19,063	6,494	20,326
Average number of common shares outstanding	[illegible]	11,754	11,645	11,432	11,303
Earnings per share of common stock from continuing operations*	$ 1.66	1.53	1.57	1.50	1.65
Dividends Paid					
Dividends per share of common stock	$ [illegible]	.80	.80	.80	1.15
Dividends on common stock	$ 9,337	9,396	9,286	9,163	12,863
Financial Position					
Total assets (less applicable reserves)	$599,731	607,430	583,306	564,583	550,210
Working capital	$171,093	173,762	183,787	165,351	155,042
Property, plant and equipment—gross	$531,415	510,258	538,620	522,232	545,222
Long-term debt	$157,136	177,325	187,724	190,497	179,328
Stockholders' Equity					
Amount	$266,827	262,439	268,235	255,747	256,222
Shares of common stock outstanding	11,327	11,765	11,668	11,504	11,348
Per share of common stock	$ 23.29	22.31	22.99	22.23	22.58
Market Data					
Stock Price					
High	18¼	23¾	26½	23⅜	34⅛
Low	10⅜	16½	16¼	12½	16
Price Times Earnings Ratio*					
High	11	15	17	16	21
Low	6	11	10	8	10
Dividend Yield					
High	7.3%	4.9%	4.9%	6.4%	7.2%
Low	4.3%	3.4%	3.0%	3.4%	3.4%
Dividend Payout*	48%	52%	49%	54%	69%

*Continuing operations. Earnings per share of common stock are before discontinued operations and extraordinary items.

**Financial and operating results of companies acquired in poolings of interests in 1971 and 1969 are included from periods of acquisition. Other years have not been restated since, in the aggregate, operations of these companies for all periods are not material in relation to the consolidated sales and operations of Airco.

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Divisions and Subsidiaries

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AIRCO ALLOYS DIVISION
3801 Highland Avenue, Niagara Falls, N.Y. 14305
Telephone: (716) 285-1252
Lawrence W. Kunkler, *President*

Airco Alloys AB
S-460 60 Vargon, Sweden
Stig Tjernstrom, *Managing Director*

Airco Alloys Ltd.
2-4 King Street, London, S.W.1, England
Robert D. Quinn, *General Manager—Sales*

Airco Alloys G.m.b.H.
Mindener Strasse 4, Cologne-Deutz 5, West Germany
Heinz Goldberg, *Managing Director*

AIRCO CARBIDE DIVISION
3801 Highland Avenue, Niagara Falls, N.Y. 14305
Telephone: (716) 285-1252
Nicholas T. Kaiser, *General Manager*

AIRCO CRYOGENICS DIVISION
1900 Main Street, Irvine, Calif. 92664
Telephone: (714) 540-3010
Paul P. Duron, *President*

Cryostar AG
Rheinstrasse 81, CH-4133 Pratteln/Basel, Switzerland
Jacques Kempf, *Deputy General Manager*

Cryostar-France SA
Boite Postal 5
Zone Industrielle
F-68220 Hesingue, France
Rene Sutter, *General Manager*

AIRCO INDUSTRIAL GASES DIVISION
575 Mountain Avenue, Murray Hill, N.J. 07974
Telephone: (201) 464-8100
David J. Craig, *Corporate Group Vice President*

Airco Cryoplants Corporation
575 Mountain Avenue, Murray Hill, N.J. 07974
Donald T. Marshall, *Vice President & General Manager*

AIRCO SPEER CARBON-GRAPHITE DIVISION
800 Theresia Street, St. Marys, Pa. 15857
Telephone: (814) 834-2801
Thomas H. Way, *President*

Speer Carbon Co. of Canada Ltd.
3200 Sartelon Street, St. Laurent, Montreal 382, Quebec
Grant M. Greenfield, *Vice President & General Manager*

AIRCO ELECTRONICS DIVISION
800 Theresia Street, St. Marys, Pa. 15857
Telephone: (814) 834-2801
Lawrence M. Liggett, *President*

Airco de Mexico S.A. de C.V.
Calle Cananea 10, Apartado 684, Nogales, Sonora, Mexico
Robert E. Brubaker, *General Manager*

Airco Singapore Pte., Ltd.
31 International Road, Jurong Industrial Estate, Singapore, 22
Andrew Kaul, IV, *Vice President, Managing Director*
Chen Choon Ching, *General Manager*

AIRCO TEMESCAL DIVISION
2850 Seventh Street, Berkeley, Calif. 94710
Telephone: (415) 841-5720
Ben W. Badenoch, *President*

Airco Temescal B.V.
Datema-House
Vliegveldweg 30
Rotterdam-Airport, Netherlands
Joseph de Bie, *Managing Director*

AIRCO VACUUM METALS DIVISION
735 Ashby Avenue, Berkeley, Calif. 94710
Telephone: (415) 845-1140
John P. Strand, *President*

AIRCO VIKING DIVISION
#1 Erik Circle, Verdi, Nev. 89439
Telephone: (702) 345-0345
M. Victor Walberg, *President*

AIRCO WELDING PRODUCTS DIVISION
Clermont Terrace, Union, N.J. 07083
Telephone: (201) 354-1212
B. Joseph Werner, *President*

OHIO MEDICAL PRODUCTS DIVISION
3030 Airco Drive, Madison, Wis. 53701
Telephone: (608) 221-1551
William A. Lunger, *President*

Air Reduction Canada Ltd.
(Ohio Medical Products Canada)
895 Hodge Street, St. Laurent, Montreal 379, Quebec
Raymond J. Fortin, *Regional Vice President*

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Treasurer

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Secretary

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Partner, Shearman & Sterling

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°Audit Committee—1973

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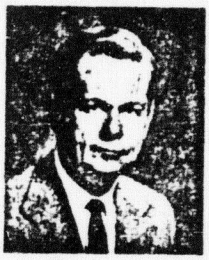
R. V. GIORDANO

C. S. MUNSON

SIR G. ELEY, C.B.E.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